



UNITED NATIONS ENVIRONMENT PROGRAMME

*Co-operative programmes sponsored  
by UNEP for the protection of the  
marine and coastal environment  
in the wider Indian Ocean region*

*UNEP Regional Seas Reports and Studies No. 58*

## PREFACE

The organizers of the Conference on Economic, Scientific and Technical Co-operation in the Indian Ocean in the Field of Marine Affairs in the context of the New Ocean Regime (Colombo, Sri Lanka, 15-20 July 1985) invited the United Nations Environment Programme to participate in the Conference. Subsequently it was agreed that UNEP would present to the Conference a review of co-operative programmes sponsored by UNEP for the protection of the marine and coastal environment in the wider Indian Ocean region. This document represents UNEP's contribution to the meeting.

The document describes the basic approach of UNEP to the environmental problems of oceans and coastal areas, the strategy used in the implementation of UNEP's ocean-related programme and the major co-operative programmes supported by UNEP in the wider Indian Ocean region. The document also contains a set of suggestions which may be considered when discussing the co-operation in the field of environmental protection of the Indian Ocean as a whole. A short summary of the document is contained in the following paragraphs.

While recognizing that the problems of the oceans are global in nature, UNEP is approaching them through a series of highly structured regional "action plans" in the framework of the Regional Seas Programme of UNEP. The action plans are formulated, adopted and implemented by the governments concerned. Each action plan has clearly defined objectives and goals and contains a set of programme elements (activities) related to the assessment of the environmental problems and to their solution through management measures. A detailed description of the five Indian Ocean Action Plans constitutes the main body of the review.

Most of the action plans are supported by legally binding regional conventions, supplemented with protocols dealing with specific problems. The financial support to activities carried out under the action plans are from the participating governments, from UNEP and from third parties, the specialized organizations of the United Nations in particular. UNEP provides for an overall co-ordination of the Regional Seas Programme and acts as the secretariat for a number of adopted action plans and conventions.

The Regional Seas Programme at present includes eleven regions<sup>1/</sup> involving more than 120 coastal states. In the framework of the programme five action plans have been adopted or are being developed in the Indian Ocean region. Inter-regional co-operation between these five action plans is proposed as the most rational and cost/effective approach towards the environmental problems of the Indian Ocean region.

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<sup>1/</sup> Mediterranean Region, Kuwait Action Plan Region, West and Central African Region, Wider Caribbean Region, East Asian Seas Region, South-East Pacific Region, South Pacific Region, Red Sea and Gulf of Aden Region, Eastern African Region, South-West Atlantic Region and South Asian Seas Region.

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## I. INTRODUCTION

### Concern for the Oceans

1. The environmental concerns of the 1960's and anxieties about the future of the human environment led to the United Nations Conference on the Human Environment, convened in Stockholm in June 1972 and were crystallized in the Declaration adopted at its conclusion. World-wide concern for the fate of the Oceans was a major element in the environmental thinking of twenty years ago and has not declined since.

2. The Stockholm Declaration <sup>1/</sup> expressed the common conviction that man bears the responsibility to protect and improve the environment for present and future generations (Principle 1) and that the natural resources of the earth must be safeguarded through careful planning and management (Principle 2). It also stated that States shall take all possible steps to prevent pollution of the seas (Principle 7).

3. Indeed, the Stockholm Conference outlined a "masterplan" for the world's environment. As inseparable elements of a global strategy it identified three components:

- (a) environmental assessment;
- (b) environmental management; and
- (c) supporting measures.

4. In other words, a strategy for:

- (a) increasing knowledge on existing and changing environmental conditions;
- (b) carefully planning and taking action to improve the environment, to safeguard natural resources through rational use, and to minimize undesirable effects; and
- (c) complementing direct action with indirect activities which would ensure that improvements are well founded and long-lasting.

5. Following the recommendations of Stockholm, the United Nations Environment Programme (UNEP) was created by the United Nations <sup>2/</sup> and has since then served as a focal point for global environmental action, and for co-ordination within the UN system. The Governing Council of UNEP defined this environmental action as encompassing a comprehensive, trans-sectoral approach to environmental problems which should deal not only with the consequences but also with the causes of environmental degradation.

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<sup>1/</sup> The full text of the Stockholm Declaration and Action Plan is reproduced in: Compendium of Legislative Authority, produced for UNEP by Pergamon Press, Oxford 1978.

<sup>2/</sup> General Assembly Resolution 2997 (XXVII) of 15 December 1972.

6. Already at the first meeting of the UNEP Governing Council attention was focused on the protection of oceans and the marine environment, on initiating assessment and monitoring activities, and on the control of pollution, including international and regional agreements with this objective <sup>3/</sup>.

7. This attitude was further strengthened by the General Assembly which emphasized the need for protecting and conserving the total living resources of ocean space and stipulated that the Governing Council of UNEP should direct special attention to the question of environmental protection of the seas and oceans <sup>4/</sup>.

#### The Regional Approach

8. Although problems of the seas and oceans are of a global nature, the Governing Council chose to deal with them through a regional approach to be applied, inter alia, to the control of marine pollution and management of marine and coastal resources. Regional agreements on the protection of specific bodies of water from pollution were to be encouraged and the study, conservation and wise management of living resources, including whales and other mammals, were to be promoted <sup>5/</sup>.

9. By adopting this approach, it is possible to focus on specific problems of high priority to the States of a given region, thereby responding more readily to the needs of the Governments and helping to mobilize more fully their own national resources. In addition, it was considered that the undertaking of activities on a regional basis would, in due time, provide the basis for dealing effectively with the environmental problems of the oceans as a whole.

10. With this in mind, the Regional Seas Programme of UNEP was initiated following the 1974 Governing Council Decision and a Regional Seas Programme Activity Centre (RS/PAC) instituted in 1977. The Regional Seas Programme has often been referred to as one of the most successful of UNEP's Programmes; at present it comprises eleven regions with more than 120 coastal States participating in it, more than 30 of them around the Indian Ocean alone.

11. The Regional Seas Programme is conceived as an action-oriented programme having concern not only for the consequences but also for the causes of environmental degradation, and encompassing a comprehensive approach to preventing and abating environmental problems through the proper management of marine and coastal areas.

12. In reviewing the activities of the Regional Seas Programme during the last ten years the Regional Action Plan approach will be discussed first.

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<sup>3/</sup> Governing Council Decision 1 (I), Section II, para 12e, of 1973.

<sup>4/</sup> General Assembly Resolution 3133 (XXVIII) of 13 December 1973

<sup>5/</sup> Governing Council Decision 8 (II), Section AI, Chapter 4, of 1974.

### The Action Plan Formula

13. At this point it is necessary to briefly describe the method used by the Regional Seas Programme of UNEP and participating States in all regions to address their particular environmental problems. Either intuitively (as originally in the Mediterranean) or after careful consideration and identification of environmental problems and priorities (as lately in the Eastern African region), States have agreed on a Plan of Action.

14. Action Plans are not identical. They are formulated according to the wishes of participating Governments and reflect the particular concerns of the region at the period of their adoption. They incorporate issues on which consensus for action is reached; they also take into account the experience gained in the implementation of previous Action Plans. They constitute the basic element of agreement; they need not, however, be static. Indeed, they are constantly amplified at periodic meetings. In the Mediterranean a complete review will probably be attempted after the first ten years.

15. Each regional Action Plan is designed to link assessment of the quality of the marine environment and the causes of its deterioration with activities for the management and development of the marine and coastal environments. The Action Plans promote the parallel development of regional legal agreements and of action-oriented programme activities. As each regional programme is aimed at benefiting the States of that region, Governments are involved from the very beginning in the formulation of an Action Plan.

16. An Action Plan is formally adopted by an intergovernmental meeting of the Governments of a particular region before the programme enters an operational phase. In the preparatory phase leading to the adoption of the Action Plan, Governments are consulted through a series of meetings and missions about the scope and substance of an action plan suitable for their region. In addition, with the co-operation of appropriate global and regional organizations, reviews on the specific environmental problems of the region are prepared in order to assist the Governments in identifying the most urgent problems in the region and the corresponding priorities to be assigned to the various activities outlined in the action plan. UNEP co-ordinates directly, or in some regions indirectly through existing regional organizations, the preparations leading to the adoption of the action plan.

17. After adoption of the plan, its implementation is carried out, under the overall authority of the Governments concerned, by national institutions nominated by their Governments. UNEP acts as an overall co-ordinator for the development and implementation of regional Action Plans - although, in some cases, this role is limited to the initial phase of the activities.

18. Financial support is initially provided by UNEP and other international and regional organizations. As a programme develops, however, it is expected that the Governments of each region will assume increasing financial responsibility for its implementation, through specific regional trust funds or other suitable mechanisms. Additional assistance continues to be made available by other bodies within the United Nations system - e.g. for technical assistance and provision of expert advice, training, or technical support. The bodies concerned are encouraged to provide this assistance as part of their normal programmes, and to finance activities through their own funding mechanisms.

19. All Action Plans are structured in a similar way (although the specific activities for any region are dependent upon the needs and priorities of that

region) along the line recommended by the Stockholm Action Plan with its three-pronged approach: environmental assessment - environmental management - supporting measures.

20. This structure has been retained throughout the life of the United Nations Environment Programme and its validity is not questioned. For the purposes of this report, however, it has been found advisable to distinguish some aspects contained within the three areas, for the following reasons:

- (a) whereas financial arrangements can, for all theoretical purposes, be termed "supporting measures", practice has shown that they constitute a chapter in themselves and are in many instances a prerequisite for further co-operative action;
- (b) similarly, institutional arrangements and legal provisions, including national environmental legislation and international agreements, while being unquestionably management tools, again constitute important aspects and should be treated in separate sections; and
- (c) finally, it has been shown that the inclusion of such basic provisions (financial, institutional and legal), under the original Stockholm chapters tends to detract from the importance of other management or supporting measures; indeed, the adoption of a legal framework or even the provision of adequate financial means has often produced exultation and self-satisfaction and left some parties with the impression that "action" was now complete; concrete action is of course what comes afterwards, through implementation of legislation, through wise use of financial resources and through the actual carrying-out of a series of management and supporting activities which should therefore be treated separately.

21. Thus, Action Plans will be viewed in this report as including, with varying degrees, the following components:

- (a) Environmental assessment. This concerns assessing and evaluating the causes of environmental problems as well as their magnitude and impact on the region. Emphasis is given to such activities as: baseline (i.e. present situation) studies; research and monitoring of the sources, levels and effects of marine pollutants; eco-system studies; studies of coastal and marine activities and social and economic factors that may influence, or may be influenced by, environmental degradation. Environmental assessment is undertaken to assist national policy makers to improve the management of their natural resources in a more effective and sustainable manner and to provide information on the effectiveness of legal/administrative measures taken to improve the quality of the environment.
- (b) Environmental management. Each regional programme includes a wide range of activities in the field of environmental management. Examples of such activities are: management of coastal areas; water management policies; control of industrial, agricultural and domestic wastes; contingency plans for dealing with pollution emergencies; establishment of protected areas such as marine parks and wetlands.
- (c) Environmental legislation. An umbrella regional convention, elaborated by specific technical protocols, most often provides the legal framework for co-operative regional and national actions. The legal commitment of Governments clearly expresses their political will to manage individually and

jointly their common environmental problems. By progressively enacting national legislation which reflects the spirit of the Action Plan and lies within the area of application of the Convention, Governments further promote its implementation in harmony with the environmental measures deemed appropriate within the region.

- (d) Institutional arrangements. When adopting an Action Plan, Governments agree upon an organization to act as the secretariat of the Action Plan. Governments decide upon the periodicity of intergovernmental meetings which are to be responsible for reviewing the progress of the agreed workplan and for approving new activities and the necessary budgetary support.
- (e) Financial arrangements. UNEP, together with selected United Nations and other organizations, provides "seed money" or catalytic financing in the early stages of regional programmes. As a programme develops, Governments of the region progressively assume full financial responsibility through annual contributions. Funds are administered by the organization responsible for the secretariat functions of the Action Plan. In addition, Governments contribute by supporting their national institutions participating in the programme or by financing specific project activities.
- (f) Supporting measures. One of the most important and most lasting effects of an Action Plan has been found to be Environmental Awareness. This is created by a series of measures including environmental education at all levels of instruction, training of cadres and technical personnel in environmental management techniques, encouraging direct participation in environmental action and arousing public interest not only through publicizing environmental disasters but also through environmental awareness campaigns, books and other publications, magazine and newspaper articles, newsletters, pamphlets, posters etc, and by publicizing correct environmental data. Supporting measures have not received adequate attention in Action Plans to date.

22. It is essential to bear in mind that all components of a regional programme are interdependent. Assessment activities identify the problems that need priority attention in the region. Legal agreements are negotiated to strengthen co-operation among States in managing the identified problems. They also provide an important tool for national policy-makers to implement national control activities. Management activities, aimed at controlling existing environmental problems and preventing the development of new ones, are one of the means by which States fulfill their treaty obligations. Co-ordinated assessment activities then continue to assist Governments by providing scientific information by which to judge whether the legal agreements and management policies are effective.

23. The key to the success of any Regional Seas Action Plan is the political agreement of the Governments concerned and the execution of the programme primarily by national institutions from the region in close co-operation with the relevant components of the United Nations system and other appropriate organizations and in close consultation among each other. The successful implementation of any Regional Seas Action Plan also depends to a considerable degree on the resolve of Governments to implement the measures commonly agreed upon or instituted by themselves within their national competence.

24. The procedures and activities that may be followed in developing an action plan are instrumental in determining the Governments' and experts' long-term commitment to the implementation of the plan's activities and whether or not the Action Plan



corresponds to the real priorities and needs of the region. Without a strong governmental commitment and a realistic programme, efforts to promote regional environmental co-operation will be short lived.

#### The Role of UNEP

25. UNEP has played a significant part in the adoption and implementation of Action Plans. Besides its catalytic and generally co-ordinating role in the initial stage, UNEP has provided an umbrella under which parties, often not on co-operative terms in non-environmental issues, can meet; it has provided seed money, often quite substantial, thus helping to create the scientific and practical infrastructure for action and co-operation; it is a central point for the collection, interpretation and dissemination of data throughout the world, incorporating them in its world-wide system; and it has passed on experience gained in other areas, ensuring that duplication of effort is avoided.

26. In most but not all Action Plans UNEP has also been requested by participating States, in many cases through the Regional Conventions adopted, to perform secretarial functions and has been entrusted with the management of Regional Funds through which the Action Plans are financed.

27. The Governing Council of UNEP has accorded high priority to the Regional Seas Programme. It has supported the institution of Action Plans and has provided the initial financing necessary for its implementation.

28. It is also appropriate at this point to pay tribute to a number of United Nations specialized agencies and other intergovernmental and non-governmental organizations which have supported the overall Regional Seas effort of UNEP, both in services and kind. To mention but a few: United Nations Industrial Development Organization (UNIDO), Food and Agriculture Organization of the United Nations (FAO), United Nations Educational, Scientific and Cultural Organization (UNESCO), Intergovernmental Oceanographic Commission (IOC of UNESCO), World Health Organization (WHO), World Meteorological Organization (WMO), International Maritime Organization (IMO), International Atomic Energy Agency (IAEA), International Union for Conservation of Nature and Natural Resources (IUCN), World Wildlife Fund (WWF).

29. Furthermore, tribute should be paid to Regional Agencies and Organizations both within and outside the UN System that have initiated, participated in or supported the Action Plans in their Region. To mention but a few: the United Nations Regional Economic Commissions, the Arab League Educational, Cultural and Scientific Organization (ALECSO), Association of South-East Asian Nations (ASEAN), Permanent Commission for the South Pacific (CPPS), South Asian Co-operative Environment Programme (SACEP), South Pacific Commission (SPC), South Pacific Bureau for Economic Co-operation (SPEC).

#### Stockholm Revisited

30. The present Report is mainly a review of past activities, while future activities will be decided by the parties concerned. However, since future activities will probably have a more general scope and will have to take into account a more global framework of environmental thinking, it is of some interest to examine the validity of the Stockholm Action Plan and to identify possible changes in environmental perceptions since its formation.

31. Going back to the Stockholm Conference, it can be said that the Principles of the Stockholm Declaration are as valid today as they were in 1972 <sup>6/</sup> and that they constitute a Code of Environmental Ethics that has not been overtaken by events.

32. However, some environmental conditions have changed since then, some societal values and environmental goals have altered and, most importantly, scientific knowledge of environmental processes has increased.

33. In consequence, some additional principles and approaches have emerged and they are as valid in the Indian Ocean as they are on a global scale. When considering the future and future activities in the Indian Ocean these should be taken into account. They can be summarized as follows:

- (a) Economic growth and the environment: At the time of the Stockholm Conference there was open apprehension, especially on the part of developing countries, that environmental protection might negatively affect development. In some quarters the desirability of economic growth itself was questioned (zero-growth theory, etc.). It is now a well established common perception that long-term economic growth is essential for meeting the aspirations of people in all countries; that enlightened conservation strategies are prerequisites if this growth is to be sustainable in the long run; and that economic growth can be simultaneous with environmental improvement.
- (b) Interconnections between environmental components: It is now common knowledge that everything in the environment is related to everything else. No component can be viewed in isolation. Actions which benefit one area may cause unforeseen damage in others. The possibility of such consequences should be considered in the planning stage. Environmental Impact Analysis is recognized as an indispensable tool in assessing the benefits and dangers from any form of activity.
- (c) Interrelations between people, resources, environment and development: Negative consequences of actions of one sector on any other were once considered only sectorally. Now, increasing emphasis is placed on defining policies and courses of action that would have beneficial, mutually reinforcing positive effects on possibly all four sectors together. Systems analysis is recognized as a useful technique.
- (d) Environmental and Socio-economic interactions: It is now universally recognized that there is no social or economic action or condition without some impact on the environment. Be it affluence or poverty, war, even novel legislation or the change in social values and aspirations, all have environmental implications. Equally, no environmental improvement or degradation is without its positive or negative socio-economic repercussions. Besides, an acceptable level of environmental quality today may become unacceptable in some future decade.

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6/ See UNEP/GC (SSC)/2, paras 138-173 for a full evaluation and analysis of some of the statements in this chapter.

- (e) Alternative life-styles and new social values and preferences have made their appearance since the 1960's. These should be taken into account in studies of alternative consumption patterns, technological styles and land-use strategies. As an example, waste is not any more considered only a hazard; it is undesirable as a concept, as much as excessive consumption. Institutional and educational frameworks should be reconsidered. New and imaginative approaches to development are called for. The unchaining of the environmental lobby and the recent political successes of environmentally oriented groups (the "greens") is but an externalization of some new social values.
- (f) Uncertainty of change: Environmental systems are never static. There is a slow process of evolutionary change, but there are also non-linearities, discontinuity and randomness in environmental processes. This is equally true in human environmental systems with continuous but also non-linear change in social and economic processes. Development plans and environmental management systems must not rely unduly on the continuation of current trends. They must also allow for discontinuities, rare events such as environmental disasters, environmental surprises such as sudden explosions of animal populations or the occurrence of smog in a hitherto "clean" city, and socio-economic surprises such as sudden rises in oil-prices, armed combat or an unexpected influx of refugees.
- (g) Interdependence of nations: It is now recognized that one of the factors of sound development lies in a regional or global, not in a localized, restricted approach. The development of nations can take place only in the context of mutual support and co-operation. Since no country can provide the whole range of goods and services, the concept of autarky, a utopian aim of self-sufficiency, results in inefficiency and relative poverty.
- (h) The venue of new technology has completely changed the possibilities of tackling problems, including environmental problems, planning processes and development issues. The exponential use of computers due to the diminishing costs of personal and other small computers constitute a revolution of capabilities in itself. Biotechnology, genetic engineering, new recycling techniques, increased use of cheaper "soft" energy and the development of remote sensing and satellite imagery, to name but a few, have expanded potentials in a way unimagined in the 1960's.
- (i) Increased knowledge of environmental processes, especially of slow environmental degradation and of long-range environmental effects have added new insight, in some cases reinforcing the fears of the early 1970's and in some cases diminishing them. Increased awareness and increased capabilities in countering environmental disasters should also be mentioned.
- (j) Environmentally sound management in coastal and maritime activities is now accepted as the key to safeguarding the marine environment. By this means, unplanned or illplanned land-use practices, the irrational exploitation of natural resources, and the pollution to which they incidentally give rise, can be avoided. Emphasis on the concept of management reflects a critical change from earlier concern that the oceans had to be preserved unchanged. Management implies use -- rational use. For example, when deciding on appropriate waste treatment and disposal practices, the waste-receiving capacity of the sea is clearly recognized as an asset which may be used for certain types of waste.

- (k) Action by Governments: There is no question that the future lies in the actions or non-actions of Governments. It has become increasingly evident from the experience in the implementation of the Regional Action Plans that while close co-ordination and co-operation among participating States is still the common goal, independent action by governments is the first step to success. Since any environmental action is primarily beneficial to conditions within the boundaries of each state, any such unilateral action is to be welcomed: it will have beneficial results to the Ocean as a whole. However, unilateral action should not be held against countries which, for reasons of their own, cannot follow suit immediately.

### The Indian Ocean

34. The Indian Ocean, a huge sea area ranging from Eastern Africa to Western Australia and bordered to the North by the South Asian subcontinent, is one of the Worlds most important seas. It covers an area of approximately 73,600,000 square kilometers (see Annex I).

35. There are as many as 38 countries including island states which are on the Indian Ocean basin. There are also a number of countries in the hinterland in Asia and Africa which are so closely inter-linked with littoral states as to constitute a part of the Indian Ocean region which may be regarded as a whole for purposes of co-operation and national management.

36. The Indian Ocean watershed extends from the heartland of Southern Africa and the Great Rift range of mountains in the West to the Himalayas in the North, the Indonesian Archipelago and the Great Australian Desert in the East. It can be a narrow strip of land as in the Arabian Peninsula to huge areas including major parts of continents. Some of the worlds important rivers flow from it, including the Zambesi and Limpopo, the Euphrates and the Tigris, the Indus and the Ganges.

37. From earliest days it has been crossed by important trade routes, not least the tanker lanes of today. Its natural resources are enormous, including primary production from fisheries and mineral deposits. The potential of their exploitation is quite remarkable. Over exploitation, or unwise exploitation, as in any other part of the world, could of course lead to undesirable degradation or even injury to those resources that are not renewable.

38. In spite of its large extent and in spite of its apparent diversity (from open ocean to semi-enclosed seas, from huge to minor islands and archipelagos, from narrow to broad watersheds, from the most arid to the most humid coasts), the Indian Ocean should be viewed as one ecosystem.

39. The approach of course may vary from one region to another; it may reflect the different problematique of each region, and different natural, social, economic and political situations; it may be divided for practical reasons or for reasons of effective management into sub-areas or sub-ecosystems. In general terms, however, and from an environmentalist's standpoint it should be considered as one united whole for purposes of conservation, co-operation, and a rational environmental overall approach.

The Health of the Indian Ocean<sup>7/</sup>

40. The Indian Ocean has a tidal range which varies from 1 to 8 m and there is a twice-yearly reversal of monsoon winds and surface currents. These help considerably to reduce the impact of pollution by dilution and dispersion and even affect bottom currents and settlement of suspended material.

41. Agriculture, industry, and in some cases mining, form the economic base of countries surrounding the Indian Ocean. Effects of pollution in the marine environment from these activities have begun to appear. These effects are so far confined to coastal areas, but owing to the prevailing wind system, the water circulation pattern, and the bottom topography, they may have far-reaching consequences on several countries.

42. Owing to increasing urbanization and industrialization all over the region, the volumes of sewage and effluents along the coasts are increasing. Many countries have large rivers flowing through them and many are badly polluted. Substantial sewage effluents are discharged untreated or after only primary treatment. However, no depletion of fish stocks or large-scale mortality have been recorded so far, although periodic fish mortality has been reported from some of the countries.

43. Aesthetics represent another problem. Hardly 50 per cent of the total population in the area has sanitation arrangements. Large coastal areas are exposed, owing to tidal fluctuations twice a day, and during low tide these places become very unpleasant. In many countries, high coliform counts are often reported from coastal waters.

44. Concentrations of toxic metals, like mercury, copper and lead in plankton and fish are still much lower than levels recorded in many industrialized countries.

45. Fertilizers, pesticides and insecticides are abundantly used in countries round the Indian Ocean, in agriculture, pest control and disease-vector control. In many countries, however, organochlorine pesticides are either totally banned or are gradually being replaced by organophosphorous and carbonate pesticides. Although no detailed study of their accumulation and harmful effects has been carried out, efforts are slowly being increased and a survey has indicated that plankton off the Indian Coast has DDT concentrations ranging from 0.05 - 3.21 ppm wet weight.

46. In countries of the region, power generation is mostly thermal, but some nuclear power is generated. So far, no harm has been reported from these sources. Radioactive wastes are disposed of in conformity with international convention. Whenever coal is used in the thermal power plants, the fly ash creates problems in the environment but experience with cooling water discharges suggests that if properly sited these do not cause a problem.

47. Tourism is being promoted in all the countries of the region. Large modern hotels have been constructed on the sea shores. In some countries refuse from such hotels has spoilt some of the beaches. Waste waters also cause problems, at times generating hydrogen sulphide in water.

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<sup>7/</sup> From GESAMP, The Health of the Oceans, Reports and Studies No. 16, UNEP, 1982.

48. Oil pollution is a chronic and sometimes acute problem in and around the harbours of all the countries in this region. In 1979 the global marine transport of oil was 1,750 million tonnes, 58 per cent of which was shipped from the Middle East countries, much of it across the Indian Ocean, both to the East and West. This, coupled with the increasing emphasis on offshore oil exploration in many countries of the region, makes the northern Indian Ocean very liable to oil pollution. Fortunately, few tanker disasters have so far occurred along these routes. The effect of oil spills is seen on the beaches of every country in the form of deposits of tar-like residues. The frequency and intensity depend on the current patterns along the coasts.

49. Coral reefs and mangroves occur widely in almost all the Indian Ocean regions and are important to the economy of many regions. Damage can occur to them due to over-exploitation and effects of pollutants.

50. The growth rate of Indian Ocean corals may be assumed to be of the order of about 0.15 - 0.5 cm per year. Several reefs have almost disappeared, owing to their exploitation to supply raw material to the cement industry. Some reefs have died owing to the impact of pollutants, particularly oil from spills. Examples of this are the Kavaratti reef in the Laccadives; the southern part of Great Nicobar Island in the Andaman group, and the south-western part of Madagascar. Dredging for harbour construction has destroyed some coral reefs of the Mahé island in the Seychelles.

51. Mangroves constitute a diverse resource in the region, they contribute to nutrient supplies, and are important spawning grounds, nurseries and feeding grounds for economically significant aquatic species. They provide protection to sensitive communities like coral reefs, and control the characteristics of bottom sediments, local mean water level and water courses. Mangroves constitute a substantial part of many countries and a significant part of the population is dependent on them.

52. The Indian Ocean receives about  $34 \times 10^8$  tonnes of suspended sediment annually, of which about  $16 \times 10^8$  tonnes come from the rivers flowing through the Indian sub-continent. This quantity is increasing owing to human activities, such as sea-bed and terrestrial mining, land clearance for agriculture, lumbering, urbanization and dredging to deepen harbours and estuaries. Most of this silt settles near the river mouths and in the coastal areas.

53. From 1959-1965 the area was the subject of an intensive co-operative investigation, which was known as the International Indian Ocean Expedition (IIOE). The IIOE programme was initiated and organized by SCOR but several United Nations bodies became involved, e.g. UNDP, UNESCO and WMO, and the then newly-formed IOC performed co-ordinating functions for several projects. Twenty-three States participated in the programme and up to 39 vessels were engaged in studies in the area which stretched as far south as the Cape of Good Hope and Tasmania and included the Red Sea and Gulf of Aden, as well as the Kuwait Action Plan regions. Much new and valuable scientific information was obtained and a far better understanding of the monsoons and the potential for fisheries development in the area was gained. The programme also generated a fundamental understanding of plate tectonics in the area.

54. There are five UNEP Regional Seas Programmes in the wider Indian Ocean region. Within the context of these programmes, four Action Plans have been adopted so far and three Regional Conventions signed. In the next two paragraphs these are underlined to distinguish them from other Regional Seas Programmes worldwide.

### Regional Seas Progress Worldwide

55. Action Plans are operative or being developed in five Regional Sea Areas in the Indian Ocean (underlined) and eleven Regional Sea Areas worldwide (see also Annexes II and III):

- the Mediterranean region (Action Plan adopted in 1975);
- the Kuwait Action Plan region (adopted in 1978);
- the West and Central African region (adopted in 1981);
- the Wider Caribbean region (adopted in 1981);
- the East Asian Seas region (adopted in 1981);
- the South East Pacific region (adopted in 1981);
- the Red Sea and Gulf of Aden region (adopted in 1982);
- the South Pacific region (adopted in 1982);
- the Eastern African region (adopted in 1985);
- the South Asian Seas region (preparation initiated), and
- the South-West Atlantic region (to be developed).

56. Regional Conventions for the protection and management of the marine and coastal environment have been adopted in seven regions as part of the Action Plans mentioned above:

- Mediterranean region, Convention signed in 1976, in force since 1978;
- Kuwait Action Plan region, Convention signed in 1978, in force since 1980;
- West and Central African region, Convention signed in 1981, in force since 1984;
- South-East Pacific region, Convention signed in 1981;
- Red Sea and Gulf of Aden region, Convention signed in 1982;
- Wider Caribbean region, Convention signed in 1983;
- Eastern African region, Convention signed in 1985.

In all regions, the conventions that have been adopted may be described as "umbrella agreements". Each convention is designed to be elaborated by specific technical protocols.

57. A more detailed description of the five Actions Plans of the Indian Ocean region follows in the next section of this report. The regions will be treated successively in a clockwise fashion, using the following acronyms (for a full list of acronyms and abbreviations see Annex VI):

- |                                   |     |
|-----------------------------------|-----|
| - Eastern African region          | EAF |
| - Red Sea and Gulf of Aden region | RED |
| - Kuwait Action Plan region       | KAP |
| - South Asian Seas region         | SAS |
| - East Asian Seas region          | EAS |

58. In some Action Plans there is an added initial chapter on Issues Addressed. These are problems which have been identified primarily in the region under which they appear, but are often characteristic of the Indian Ocean as a whole. They have not been included in all Action Plans in an effort to avoid duplication. This of course is not possible in the description of the Action Plans themselves.

## II. THE FIVE INDIAN OCEAN ACTION PLANS

### 1. The Eastern African Region<sup>8/</sup>

#### A. Issues addressed

59. Environmental problems in the Eastern African Region have been identified and reported by a joint UNEP/UN/UNIDO/FAO/UNESCO/WHO/IMCO/IUCN exploratory mission, and reviewed at a workshop which took place in Mahé, Seychelles, 27-30 September 1982.

#### Planning and Management of Coastal and Marine-Related Land Use

60. The main issues of concern have to do with the protection and management of marine and coastal resources.

61. The chief geographical characteristics of concern in considering the effect of land use practices on the marine environment along the coastline are the nature of the immediate shoreline areas (beaches, lagoons, reefs and dunes; or estuarine areas including mangrove forests); the patterns of human occupancy and activity in the relatively narrow coastal strip which generally consists of a gently sloping plain; and the utilization of upland areas in ways that may affect the coastal or marine environment, especially through changed rates or volumes of freshwater release or sedimentation. The effect of the latter is especially felt on the Mozambique coast along which some twenty-five main rivers enter the Indian Ocean.

62. Coastal characteristics of the smaller islands of the Western Indian Ocean are quite different from those of the continent and Madagascar. On these islands the entire land mass can be considered as included in the coastal zone in the sense that activities nearly anywhere would have an effect on the marine environment. Similarly, due to the limited land resources, the location of development or the siting or conduct of various operations or activities is an important aspect of planning in which marine-related factors must be taken into account. The primary problems on the islands from the coastal zone management point of view are the protection and management of the immediate shorelines, the planning of urban and other economic growth and the prevention of localized effects resulting from shorefront or inland activities.

63. The chief coastal land use issues from a marine perspective are livestock raising and agriculture in the coastal zone; the planning, control, and servicing of urban development in this area; the planning and assessment of major coastal facilities such as industrial projects, tourism facilities, and ports; the development of marine fisheries; and the conservation of coastal and nearshore natural resources.

#### Erosion/Sedimentation

64. Perhaps the most obvious effect of human activities on the marine environment of the Western Indian Ocean is the tremendous increase in siltation from major rivers as a result of soil erosion, caused chiefly by upland activities.

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<sup>8/</sup> Extracted from documents RSRS 6-12 and 53, UNEP/IG.60/4-5, UNEP/WG.77/4, and UNEP/WG.117/5.



65. Sedimentation along the continental-type coastlines has begun to change the very nature of the shoreline and the related natural systems in many areas. The huge volume of sediment that is being carried down the major rivers of the region is slowly increasing the formation of river deltas and other estuarine areas and encouraging the spread of mangrove forests. Sedimentary accumulations in the coastal zone are affecting the natural courses of rivers, extending flood plains and modifying the composition of beaches and sea bottoms.

66. While some soil erosion occurs within the coastal zone, the most significant problems of soil loss are in inland areas - especially the elevated plains or uplands where most of the population of East Africa and Madagascar is concentrated. The erosion/sedimentation problem is unique among the environmental problems of the region as its effects, although originating primarily in areas well inland, are also felt in important ways on the coast.

67. While depleting cultivable land resources upland, soil erosion affects the coast negatively in numerous ways: accretion of beaches and loss of tourism potential; loss of coral reefs through smothering, loss of light due to turbidity, and nutrification; this, deplorable in itself, may cause further erosion of the shoreline; flooding of river valleys, coastal plains, and deltas; effects on the characteristics and productivity of estuarine areas; deposition of sedimentary material in the continental shelf; siltation of the coast, dams and irrigation works.

68. Another source of disruption of balanced coastal ecosystems are hydrodevelopment projects. These often have effects on the flow and sedimentation rates with similar if sometimes opposite effects as enumerated in the previous paragraph. Environmental Impact Studies should be conducted before embarking on such projects.

#### Other activities with an impact on the coast

69. Development in the coastal zone also affects the coast in a number of ways: loss of unaffected coast to urbanization with additional problems of waste disposal etc; the practice of shifting cultivation, bushfires and livestock raising can be destructive to fragile coastal and dune vegetation; major agricultural projects, as well as intensified decentralized agriculture, are particularly disruptive; house construction requires extensive mining of limestone from ancient or existing coral reefs; industry puts a strain on the coast: agro-industry to a lesser and large industrial plants to a greater extent (cement plants use limestone, chemical and textile plants create toxic effluents including dyes and heavy metals, refineries pose dangers of oil-spills).

#### Coastal and marine habitats

70. The coastal regions of East Africa, Madagascar, and the smaller islands fall within several biogeographic provinces which determine the characteristic fauna and flora of the various ecotypes that exist along the coast and in the nearshore environment. Several ecotypes that provide important habitats for the characteristic marine life of the region should be singled out for special attention: coastal dry forests; coastal dunes; coastal floodplains; fresh and brackish water marshes; mangrove forests; coral reefs; reef-back lagoons; sandy beaches; and sea-bird rookeries (sea cliffs and nearshore islands). Protection of these areas is warranted for several reasons, such as their functions as habitat for local species of fauna including fishes and migratory birds; in shoreline stabilization and in

prevention of inland or coastal erosion in conserving marine fisheries productivity; and for touristic and recreational purposes. Valuable marine habitats along the coast and in nearshore waters are threatened directly or indirectly by a variety of human activities.

71. One especially valuable marine habitat of the region is the extensive mangrove forests characteristic of western Madagascar and the continent southward from Somalia, and which exist elsewhere in the region in pockets. The mangroves provide critical habitat as nursery grounds for the shrimp which form such an important economic resource in the countries with extensive mangroves. Here and in other areas in the region, the mangroves also provide habitat for the fry of marine fish and year-round habitat for various crustaceans, especially crabs. They also trap sediments released from rivers, binding some and freeing some sedimentary nutrients at a relatively uniform rate into nearshore waters. The mangroves can also serve as a sink for pollutants from coastal and upland sources.

72. The mangroves in Eastern Africa are threatened by various activities. In some areas they are extensively cut for poles and for firewood and charcoal, some exported, under licence or illegally, to the Middle East. In other areas mangroves have been lost by the clearing of salt-pans, often they are subject to a certain volume of usage as construction materials or a source of tannins for leathermaking. The vitality of mangrove swamps is also threatened by fluctuations in the amount of fresh water and sediment reaching them due to upstream hydraulic works. Mangrove areas are sometimes reclaimed and converted for salt ponds and occasionally to make way for other economic activities such as port expansion. Mangroves can also be threatened if siltation from rivers degrades protective reefs and exposes the shore to increased erosion. Loss of the extent and vitality of mangrove forests can reduce marine biological productivity of dependent species, especially shrimp.

73. Coral reefs are threatened by siltation of nearshore marine areas due to terrestrial erosion. They are also exposed to chronic but low-level oil pollution in some areas, especially in the vicinity of harbours. Coral reefs are sometimes dredged or subjected to turbidity by dredging in connection with port improvement and maintenance, or land reclamation. Corals and associated marine life are collected as souvenirs, especially near tourist areas. Reefs are also subject to unenlightened and destructive fishing practices, such as dynamiting and poisoning. The balance of life in the reef ecosystem can also be affected by overfishing of certain species. Changes in reef ecosystems could lead to depletion of fisheries potential and to loss of aesthetic and recreational values.

74. Other coastal and marine habitat areas such as coastal dry forests, coastal dunes, coastal floodplains, fresh and brackish water marshes, reef-back lagoons, sandy beaches, and sea-bird rookeries are also threatened by human encroachment, especially for gathering of natural products and conversion to economic uses. Severe loss of such habitats would seriously affect associated populations of coastal and marine animal species and related aesthetic values.

#### Protection of rare and endangered marine species

75. The coasts and seas of the region provide habitat for several rare or endangered species - such as marine turtles, the dugong, the Nile crocodile, sea-birds and migratory birds, and indigenous coastal birds and mammals - that cannot be effectively protected until : more is known about their location and behaviour; critical habitats are identified and preserved; and human activities adversely affecting them are controlled to the extent possible. Actions on the national, regional, and global level can be helpful in this context.

### Fisheries development

76. In general the periphery of the Indian Ocean, and especially the Eastern African area, are characterized by primary biological productivity lower than that of the other oceans, except for certain favoured locations, owing to the narrow continental shelves.

77. Coastal fishery potential in the region is therefore limited and the major fisheries occur in shallow shelf areas for shrimp; in nearshore waters and in estuaries for small, including small pelagic, species; and on and near reefs for reef fishes and demersal species. The Western Indian Ocean is, however, also characterized by the presence of schools of highly migratory, or large pelagic species, especially small tunas (bonito and skipjack); these could form the basis of an offshore fishing industry.

78. Artisanal fisheries should be enhanced and commercial fishing encouraged, provided that overfishing can be controlled and fishing gear with no detrimental effects on coral reefs and fish (fry) populations is chosen.

79. The regional pelagic fishery resources, mainly of highly migratory tunas, are perhaps the most significant economically but also present the greatest technical, economic and political difficulties. Further significant unrealized opportunities exist. Regional co-operation will be necessary on development and allocation of regional fishery resources.

### Oil pollution

80. The Western Indian Ocean is a major transit route for tankers carrying crude oil from the Arabian Peninsula and which use the Cape route. In addition, practically all the countries are actively searching for oil and gas along the coastal plain and continental shelf and banks, with external assistance. Some of these countries, e.g. Tanzania and Mozambique have already discovered gas deposits.

81. A number of problems emerge. The transit tankers as well as those delivering crude or refined oil to the countries of the region often ballast in the open sea. The oil so released has found its way to the coastline where, like on Comoros, Somalia, Kenya and Mauritius this forms into balls or is deposited on beaches and coral heads, thus severely affecting the tourist activities of the region. At the same time deposition on coral and other habitats such as mangroves directly affects life on these habitats; free swimmers and sea birds are also affected.

82. Besides, there have been oil spills especially at receiving/loading facilities. Dar-es-Salam harbour witnessed this in 1981 and a wide range of marine life was severely affected. The discovery of a new oil field also presents certain oil spill dangers. It is evident therefore that rigorous preventative measures are undertaken at the harbours, depots, and in order to prevent tanker owners deballasting tankers at sea. It is worth noting that currents flow towards the coast and not away from it.

### Pollution from land-based sources

83. The industrial sector in the region is not large and is primarily oriented toward the processing of agricultural products. The necessity, nevertheless, exists for the rational management of all forms of industrial wastes, including their ultimate disposal into the marine environment.

84. The general regional concentration on agro-industries means that the primary waste management problem is the need to dispose of rather large amounts of organic matter which is generated in the form of suspended solids, larger particles and sludges, and dissolved substances - all of which contribute to total biochemical oxygen demand (BOD). The productive biological characteristics of rivers, bays, wetlands, and other water bodies that receive this material can be affected if natural tolerance levels are exceeded. In Mauritius heavy mortality of fish and invertebrates has been observed.

85. With respect to domestic sewage discharges and excreta disposal in coastal settlements these are to be considered rather as one of the major public health problems of the region than as a contributor to marine pollution of any significance. Similarly, present level of agrochemicals are not so significant as to cause concern.

#### Environmental Health Factors

86. Inexistence or poor facilities in sewage discharges and solid waste disposal pose a severe threat to the local population. Similarly, health problems arise as only about 30% of the rural population in the entire region has access to relatively safe water supplies.

#### 8. The Eastern African Action Plan

87. Being the latest one to be adopted, the Eastern African Action Plan encompasses the experience gained by the previous regional co-operative programmes within the constraints and special concerns of the States of this region. Deliberations leading to its adoption took rather a long time - over 5 years.

88. By decision 8/13 C of 29 April 1980, the Governing Council of UNEP called for the development of an action plan for the protection and development of the marine and coastal environment of the Eastern African region.

89. As a first step towards developing a programme for the Eastern African region, UNEP sponsored a joint UNEP/UN/UNIDO/FAO/UNESCO/WHO/IMO/IUCN exploratory mission to the region. The mission was expected:

- (a) to assess each State's interest in participating in a regional programme;
- (b) to consult with Governments with a view to identifying activities that could usefully be concluded as part of a comprehensive action plan; and
- (c) to discuss with Governments the steps to be followed which might successfully lead to the early adoption of an action plan.

90. The findings of the mission were used in the preparation of six sectoral reports and an overview on the environmental problems of the region. The six sectoral reports and the international organizations that assisted in their preparation are:

- (a) Marine and coastal area development in the East Africa region - UN/UNESCO;
- (b) Industrial sources of marine and coastal pollution in the East African region - UNIDO;

- (c) Marine pollution in the East African region - FAO;
- (d) Public health problems in the coastal zone of the East African region - WHO.
- (e) Oil pollution control in the East African region - IMO;
- (f) Conservation of the coastal and marine ecosystems and living resources in the East African region - IUCN.

91. These reports were then submitted to the Workshop on the Protection and Development of the Marine and Coastal Environment of the East African Region (Mahé, Seychelles, September 1982) which was attended by experts designated by the Governments of the East African region. At the workshop, the experts: reviewed the environmental problems of the region; endorsed a draft action plan; defined a priority programme of activities; and recommended that the draft action plan, together with a draft regional convention, be submitted to a conference of plenipotentiaries of the Governments of the region with a view to their adoption.

92. From the workshop it became clear that the priority concerns of the region included:

- (a) conservation of marine and coastal ecosystems and wild fauna and flora;
- (b) support and training for monitoring and research related to the sources, levels and effects of pollutants;
- (c) contingency planning in cases of marine pollution emergencies;
- (d) fisheries related projects;
- (e) environmental impact assessment;
- (f) environmental education; and
- (g) coastal erosion.

93. A list of projects requiring immediate attention and to be carried out within the framework of the action plan are set out in Annex V of this report, since they are considered useful for more general consideration as an example of specific regional concern.

94. Taking into account the decisions of the workshop, UNEP concentrated its efforts and resources on activities related to the formulation and early adoption of the convention and its protocols. Thus, UNEP prepared the first draft of the convention and, in co-operation with IMO and IUCN, prepared preliminary drafts of the two protocols. In addition, the preparation of a series of country reports was initiated on regional environmental legislation, natural resources and conservation, and on socio-economic activities which may have an impact on the quality of the marine and coastal environment. With the collaboration of FAO and IUCN these reports were synthesized and published by UNEP as three regional reports.

95. All of these documents were submitted to a meeting of experts on a draft convention and protocols for the Eastern African region, convened by UNEP in Nairobi in December 1983. Experts from all nine States of the region attended. The meeting made considerable progress in reaching a consensus on the agreements, but a few points, including the technical annexes to the protocol on protected areas and wild fauna and flora, were left unresolved.

96. A second meeting of experts, convened in October 1984, also in Nairobi, concluded with a consensus on nearly all of the provisions of the convention and protocols and recommended that a conference of plenipotentiaries be convened to adopt the final texts of the action plan and the three legal agreements. The meeting also considered the institutional and financial arrangements that would need to be adopted by Governments to support the co-ordination and implementation of the regional programme.

97. The Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region, together with the three legal documents, i.e. the Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region, the Protocol concerning Protected Areas and Wild Fauna and Flora and the Protocol concerning Co-operation in Combating Marine Pollution in Cases of Emergency were adopted by and signed at the Conference of Plenipotentiaries held in Nairobi, 17-21 June 1985.

98. For the purposes of this action plan, the Eastern African region is defined as including the waters of the Indian Ocean within the jurisdiction of the following States: Comoros, France, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia and the United Republic of Tanzania. The region also includes coastal areas, the specific geographical limits of which will be determined by the Governments concerned on an ad hoc basis, taking into account the particular activity to be carried out.

99. The general goals and objectives of this action plan for the protection and development of the marine and coastal environment are:

- (a) To promote the sustainable development and sound management of regional marine and coastal resources by:
  - (i) Enhancing consultations and technical co-operation among the States of the region;
  - (ii) Emphasizing the economic and social importance of the resources of the marine and coastal environment;
  - (iii) Establishing a regional network of co-operation on concrete subjects/projects of mutual interest for the whole region;
- (b) To establish general policies and objectives and to promote appropriate legislation for the protection and development of the marine and coastal environment on a national and regional level;
- (c) To prevent pollution of the marine and coastal environment within the region originating from activities within the States of the region or from operations primarily subject to the jurisdiction of extra-regional States;
- (d) To provide for the protection and national development of the living resources of the region, which are a natural heritage with important economic and social values and potential, through the preservation of habitats, the protection of species, and the careful planning and management of human activities that affect them;
- (e) To strengthen and encourage, through increased regional collaboration, the activities of institutions within the region involved in the study of marine and coastal resources and systems;

- (f) To improve training and assistance at all levels and in all fields relating to the protection and development of the marine and coastal environment;
- (g) To stimulate the growth of public awareness, at all levels of society, of the value, interest, and vulnerability of the region's marine and coastal environment.

100. More specifically, the activities of the action plan should result in:

- (a) Assessment and evaluation of the causes, magnitude and consequences of environmental problems, in particular assessment of marine pollution and study of coastal and marine activities and social and economic factors that may influence, or be influenced by environmental degradation;
- (b) Promotion of methods and practices for the management of socio-economic development activities that safeguard environmental quality and utilize resources wisely and on a sustainable basis;
- (c) Adoption of regional legal agreements and strengthening of national legislation for the protection and development of the marine and coastal environment;
- (d) Establishment of institutional machinery and adoption of financial arrangements required for the successful implementation of the action plan.

101. A general description of the main components of the action plan is given below. These components and the related activities are not listed in order of priority.

a. Environmental assessment

102. Assessment of the environmental processes of the region is incomplete. Because sound action requires an understanding of the intricate links between development and the environment, there exists a need for continuing systematic assessment of the main factors influencing environmental quality. Among the tasks that should be performed are:

- (a) Assessment of national and subregional capabilities to investigate and manage environmental processes, including scientific and administrative institutions, manpower, research facilities, and equipment, together with identification of institutions with potential to serve as "regional activity centres" in particular disciplines, and as regional or subregional activity centres co-ordinating specific inter-State projects;
- (b) Encouragement of collaboration among regional scientists and technicians and their institutions through the establishment of a co-ordinated regional marine pollution monitoring programme, based on intercomparable methods for the assessment of the sources and levels of pollutants and their effects on marine life and human health;
- (c) Strengthening of capabilities in marine science and for monitoring and assessment the state of the marine and coastal environment and the condition of living resources including the training of scientists and technicians from the region in methods and techniques related to the assessment and evaluation of marine pollution;
- (d) Compilation of an inventory of the sources and amount of pollutants reaching the coastal waters of the region from land-based and maritime sources;

- (e) Collection, analysis and dissemination of data on resource potential, resource utilization and coastal habitats of the region;
- (f) Analysis of data on competing demands for resource utilization;
- (g) Survey and assessment of present socio-economic activities, including development projects, that may have an impact on the quality of marine and coastal environment.

b. Environmental management

103. The key to sustainable, environmentally sound development is wise management of the resource base. Such management should take into account the assimilative capacity of the environment, the goals of development as defined by national authorities, and the economic feasibility of their implementation. The following activities may be undertaken to strengthen the ability of Governments to adopt appropriate environmental management policies;

- (a) Strengthening or expansion of the relevant ongoing development activities that demonstrate sound environmental management practices;
- (b) Co-operation on preparedness for pollution emergencies and measures to mitigate their consequences;
- (c) Co-operation on application of existing international measures to reduce and control pollution by hydrocarbons;
- (d) Formulation of regionally and locally applicable guidelines and standards for management and control of domestic, agricultural and industrial wastes, including the development of principles governing treatment and discharge of such wastes;
- (e) Harmonization of policies on the management of wildlife, genetic resources and natural habitats;
- (f) Co-operation in the establishment and management of protected coastal and marine habitats, such as wetlands, nurseries and breeding grounds, coral reefs and mangroves, including training of technical personnel and managers in the conservation of wildlife and habitats, and mapping of critical coastal and marine habitats;
- (g) Co-operation in devising alternative land-use practices and development patterns appropriate for conditions in the region, including improvement of national capabilities to assess the environmental impact of development proposals;
- (h) Co-operation in the exploration and utilization of fisheries to achieve the most rational utilization on a sustainable basis;
- (i) Studies of the environmental, social and cultural effects of tourism, and elaboration of alternative strategies for tourism development. Particular attention should be given to the health aspects of tourism installations in coastal resort areas, including drinking water quality, sanitation and food safety.



c. Legal component

104. As already mentioned the three legal documents, i.e. the Convention and the two Protocols were adopted at the June 1985 Conference of Plenipotentiaries.

105. The substantive part of the Convention includes provisions on general obligations, pollution from ships, pollution caused by dumping, pollution from land-based sources, pollution from sea-bed activities, airborne pollution, specially protected areas, co-operation in combating pollution in cases of emergency, environmental damage from engineering activities, environmental impact assessment, scientific and technical co-operation, and liability and compensation.

106. Of special interest is the Protocol Concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region, as it is the first such Protocol to be adopted in the Indian Ocean.

107. The general undertaking under this Protocol is that the Contracting Parties shall take all appropriate measures to maintain essential ecological processes and life support systems, to preserve genetic diversity, and to ensure the sustainable utilization of harvested natural resources under their jurisdiction. In particular, the Contracting Parties shall endeavour to protect and preserve rare or fragile ecosystems as well as rare, depleted, threatened or endangered species of wild fauna and flora and their habitats in the Eastern African region.

108. To this end, the Contracting Parties shall develop national conservation strategies and co-ordinate, if appropriate, such strategies within the framework of regional conservation activities.

109. Special provisions are given for the protection of wild flora, for species of wild fauna requiring special protection, for harvestable species of wild fauna, for migratory species, for the introduction of alien or new species, for the establishment of protected areas, for the adoption of common guidelines, standards or criteria, for general protection measures, for the establishment of buffer areas, for taking into account traditional activities of local populations, and for establishing frontier protected areas.

110. The Protocol Concerning Co-operation in Combating Marine Pollution in Cases of Emergency includes provisions on the exchange of information and on the communication of information concerning, and the reporting of, marine pollution incidents; it also includes provisions on mutual assistance and on operational measures for responding to a marine pollution incident. It finally calls upon contracting parties to enter into appropriate bilateral or multilateral subregional arrangements.

d. Institutional arrangements

111. The following institutional arrangements have been agreed upon and incorporated in the Convention and Action Plan:

- (a) Meetings of the Contracting Parties will be the ultimate authority for keeping under review the implementation of the Convention, the Protocols and the Action Plan.
- (b) An appropriate national authority will be designated by each Government to facilitate the work of, and communication with, the secretariat and to co-ordinate the activities of an inter-disciplinary programme at the national level.

- (c) In carrying out the action plan, the national capabilities available in the region and the capabilities of regional and international organizations and co-ordinating bodies, as well as their existing regional programmes, will be used to the greatest possible extent.
- (d) The agreed programme will be executed primarily through existing national institutions. Where necessary, they should be strengthened so that they may participate actively and effectively in the various projects. For some of the projects, in their initial phase, the assistance of experts from outside the region may be requested.
- (e) An Arbitral Tribunal consisting of three members will concern itself, whenever necessary, with issues calling for arbitration among Contracting Parties.

112. The United Nations Environment Programme has been designated by the Contracting Parties as the Secretariat of the Convention and the Action Plan and will co-ordinate the implementation of all co-operative activities.

e. Financial arrangements

113. The action plan calls for the following financial arrangements:

- (a) The activities agreed upon as part of the implementation of the action plan will be financed principally by contributions from Governments, international organizations and non-governmental organizations. Initially, support will be provided by the United Nations system on the assumption that this financial contribution will progressively decrease as the Governments themselves assume financial responsibility for the programme.
- (b) The ultimate aim is to make the proposed regional programme self-supporting, not only by developing institutional capabilities to perform the required tasks, but also by supporting the provision for training, equipment and other forms of assistance from within the region.

114. It has been decided to establish a Trust Fund for the Eastern African Region, to be financed by proportional contributions from the States and a contribution from the EEC. The Trust Fund will be administered by UNEP according to the applicable rules of the United Nations.

f. Supporting measures

115. As support for the activities of the regional co-operative programme, the action plan calls for intensive training programmes to be formulated for personnel from the region. These programmes should be carried out through existing national, regional or international institutions ready to offer their facilities.

116. Campaigns should be instituted on a national basis to create public awareness of national and regional issues relating to the protection and development of marine and coastal resources.

117. Education in the principles of protection and development of marine and coastal resources should be provided as part of the ordinary educational curricula at primary, secondary and university levels, through training of special instructors or specialized training of general educators, and seminars and courses offered to the general public.

## 2. The Red Sea and Gulf of Aden Action Plan

118. This Action Plan was adopted at an intergovernmental conference at Jeddah, Saudi Arabia, in January 1976 and reoriented at a conference of plenipotentiaries held at Jeddah in February 1982. The Action Plan <sup>9/</sup> calls for the efficient conservation and management of the coastal and marine environment and its resources in the region.

119. The Red Sea and Gulf of Aden Environment Programme (PERSGA) was initiated by the Arab League Educational, Cultural and Scientific Organization (ALECSO) as an Action Plan for 1975, resulting from the First Jeddah Expert Meeting, November 1974, following a preparatory meeting organized by UNESCO at Bremerhaven, Federal Republic of Germany in October 1974.

120. An intergovernmental meeting, also at Jeddah, in January 1976 adopted the first version of the Action Plan mentioned above and the Jeddah Declaration calling for the effective Protection of the Environment through a long-term Action Plan and a Convention of the States of the Region.

121. A second Conference at Jeddah in January 1978, successive meetings of the Red Sea and Gulf of Aden Co-ordination Board and Directing Board, and two legal and environmental experts meetings (Tunis, 1980 and Jeddah, 1981) led to the realization of the Jeddah declaration: the adoption of the Action Plan in its present form and the signing of the Convention and a Protocol on Co-operation in Emergencies at a Conference of Plenipotentiaries at Jeddah in January 1982. Seven parties have so far signed the legal agreements which will enter into force in July 1985.

122. The Action Plan aims to achieve the following:

- (a) Assessment of the state of the environment including socio-economic development activities related to environmental quality and of the needs of the Region in order to assist Governments to cope properly with environmental problems particularly those concerning the marine environment;
- (b) Development of guidelines for the management of those activities which have an impact on environmental quality or on the protection and use of renewable marine resources on a sustainable basis;
- (c) Development of legal instruments providing the legal basis for co-operative efforts to protect and develop the Region on a sustainable basis;
- (d) Supporting measures including national and regional institutional mechanisms and structures needed for the successful implementation of the Action Plan.

123. The Action Plan Region includes the Red Sea, the Gulf of Aqaba, the Gulf of Suez, the Suez Canal to its connection with the Mediterranean, and the Gulf of Aden.

124. The conservation of the marine environment and coastal areas is considered as the axis of the Action Plan; and it is intended that measures for marine and coastal environmental protection and development should lead to the promotion of human health and well-being as the ultimate goal of the Action Plan.

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<sup>9/</sup> Extracted from an unofficial translation of the official Arab text.

125. The Action Plan is intended to meet the environmental needs and to enhance the environmental capabilities of the Region and is aimed primarily toward implementation through co-ordinated national and regional activities. To achieve this goal, an intensive training programme should be formulated in the early phases of the implementation of the Action Plan.

126. A general description of the various components of the Action Plan is given in the following paragraphs.

a. Environmental assessment

127. Environmental assessment is one of the basic activities which will underlie and facilitate the implementation of the other components of the Action Plan.

128. The identification of the present quality of the marine environment and the factors currently influencing its quality and having an impact on human health is given priority together with an assessment of expected developments.

129. Although some basic data on the marine environment have been collected by some institutions in the Region, much remains to be done in the Region as a whole. Therefore, a co-ordinated basic and applied regional marine sciences programme including a marine meteorological programme is formulated as a basis for the protection of the marine environment of the Region. In formulating the operational details of these programmes, planned and ongoing national and regional programmes are taken into account.

130. The following programmes are recognized as components of the co-ordinated regional environmental assessment programme:

- (a) Survey of national capabilities of the Region in the field of marine sciences including marine meteorology covering: scientific and administrative institutions; information centres and data sources; research facilities and equipment; manpower; existing environmental laws and regulations; ongoing and planned activities; publications.
- (b) Assessment of geological and geophysical processes such as sedimentation contributing to, or modifying, the fate of pollutants in the Region, and their impact on human health, marine ecosystems and human activities, as well as effects of coastal and deep sea engineering and mining.
- (c) Assessment of the origin and magnitude of oil pollution in the Region comprising baseline studies on the sources of oil pollution and the transport and distribution of oil and petroleum hydrocarbon pollution.
- (d) Assessment of the magnitude of pollutants affecting human health and marine ecosystems of the Region consisting of: a survey of land-based sources; studies on the impact of industrial and municipal wastes on human health; research on effects of pollutants and other human activities, such as dredging and land reclamation on important marine species, communities and ecosystems.
- (e) Assessment of factors relevant to the ecology of the Region and to the exploitation of its living resources including: a survey of environmental parameters of the coasts of the Region, including floral cover, and faunal distribution; biology of coral reefs and marine species especially those of commercial importance such as fisheries, the biology of other marine organisms threatened by extinction and plankton productivity and distribution.

131. All programmes are interdisciplinary and interrelated in nature. The priorities assigned to the activities listed above are determined by the Governments of the Region taking into account the present level of development in the Region and the pressing need to provide reliable and comparable data on which sound management decisions can rest. The agreed programme is executed, primarily, through existing national institutions within the framework of regional co-operation.

b. Environmental management

132. Continuous socio-economic development can be achieved on a sustainable basis if environmental considerations are taken into account. To assist the Governments of the the Region in the development of appropriate policies and strategies for conservation of the marine environment of the Red Sea and the Gulf of Aden, the Action Plan is engaged in carrying out the following activities:

- (a) Preparation and up-dating of a directory of Government-designated institutions available in the Region and active in fields related to the environmental management components of the Action Plan;
- (b) Identification of present and future development activities and their major environmental impact in order to evaluate the degree of their influence on the environment and to find appropriate measures to either eliminate or reduce any damaging effects which they may have;
- (c) Identification of the most relevant ongoing national, regional or internationally supported development projects which have beneficial environmental effects such as various FAO projects for fisheries development, environmental health activities and projects sponsored by WHO or assistance programmes on the treatment of industrial wastes by UNIDO. The most significant of these projects should be strengthened and expanded to serve as demonstration and training sites on a regional basis.

133. Furthermore, in view of the priorities and needs of the Region, the following co-operative programmes relevant to the management of regional environmental problems stemming from national development activities will be undertaken:

- (a) rational exploitation and management of marine living resources on a sustainable basis; and the establishment of aquatic and land protected areas such as coral reef protected areas, wetlands, marine parks and others;
- (b) Assistance in development and inter-co-ordination of national capabilities in science and engineering knowledge needed for regional environmental protection;
- (c) Strengthening the national public health services and their co-ordination wherever trans-boundry interests require it;
- (d) Co-ordination of national water management policies including community water supply and water quality control, whenever they may have impact on the marine environment of the Region;
- (e) Development of principles and guidelines for coastal area development and management through workshops and seminars including those on environmental impact assessment;
- (f) Formulation of national contingency plans for combating oil pollution;

- (g) Upkeep of records of pollution incidents by oil or other harmful substances in the Region including information on the impact of such pollution on the marine environment.

c. Legal component

134. The legally binding documents signed at Jeddah on 14 February 1982, are:

- (a) The Regional Convention for the Conservation of the Red Sea and the Gulf of Aden Environment;
- (b) The Protocol concerning Regional Co-operation in Combating Pollution by Oil and other Harmful Substances in Cases of Emergency hereinafter referred to as the Emergency Protocol.

135. The Regional Convention is noteworthy, inter alia, for the following provisions:

- (a) it uses the World Conservation Strategy (IUCN/UNEP/WWF, 1980) definition of conservation, providing not only for conservation in the classical sense but also "for the rational use by man of living and non-living marine and coastal resources in a manner ensuring optimum benefit for the present generation while maintaining the potential of that environment to satisfy the needs and aspirations of future generations", a management rather than protectionist attitude;
- (b) its geographical coverage does not include internal waters unless otherwise stated in any of its protocols; indeed the Emergency Protocol does include them "if the Contracting Party concerned so decides",
- (c) concerning pollution from ships and dumping, it makes direct reference to "generally recognized international rules", thus precluding the necessity of formulating relevant protocols;
- (d) not so concerning pollution from land-based sources and other human activities in which it includes land reclamation and estuarine and river dredging; and
- (e) it establishes a specific regional organization consisting of a Council, a General Secretariat and a Committee for the Settlement of Disputes.

136. The Emergency Protocol:

- (a) establishes a Marine Emergency Mutual Aid Centre (MEMAC) whose functions are, inter alia : to strengthen the capacities of the Parties and to facilitate co-operation among them in order to combat pollution, to assist Parties in developing their combating capabilities, to assist with information and training, and, if agreed upon at a later stage, to develop operational capabilities in combating pollution with its own proper means.
- (b) requires Parties to develop their own combating capabilities and to hold them at the disposal of other Contracting Parties that may require assistance in the case of an emergency.
- (c) requires Parties to establish and maintain an appropriate authority to carry out fully its obligations under the Protocol.

137. Furthermore ALECSO is called upon, within the legal component of the Action Plan and in co-operation with the Governments concerned, to prepare additional protocols which will include:

- (a) pollution from land-based sources;
- (b) pollution resulting from exploration and exploitation of the sea bed, the continental shelf and the subsoil;
- (c) scientific and technical co-operation in the field of marine environment and coastal areas conservation;
- (d) development, conservation, protection and harmonious utilisation of the marine living resources of the Region;
- (e) liability and compensation for damage resulting from pollution of the marine environment;
- (f) any protocol on other subjects found important to the Region during the execution of the Action Plan.

138. A special appeal is made to Governments of the Region to strengthen measures for implementation of the international Conventions pertaining to pollution from ships through normal operations or dumping activities.

d. Institutional arrangements

139. The Arab League Educational, Cultural and Scientific Organization (ALECSO) was designated as the secretariat of the Action Plan (Red Sea and Gulf of Aden Environment Programme - acronym PERSGA) on an interim basis, i.e. until the establishment of the Regional Organization for the Conservation of the Marine Environment (as provided for in the convention) which will assume the secretariat functions for PERSGA and the Jeddah Convention. A Council and a Committee for the Settlement of Disputes is also provided for by the Convention.

e. Financial arrangements

140. ALECSO, with the initiative of its Director General, is rendering assistance and contributes to the costs of implementing the Action Plan. Other financial burdens are shared by the Contracting Parties at rates agreed upon and reflecting the financial capabilities of each State.

f. Supporting measures

141. An extensive training programme for personnel from the Region is provided for as part of the management component of the Action Plan; training programmes are also part of the responsibilities of MEMAC.

142. Systematic and regular campaigns for public awareness of environmental issues in the Region are also provided for in the Action Plan in which all parties concerned should co-operate in lending complete support, and by devoting adequate resources.

3. The Kuwait Action Plan Region <sup>10/</sup>

A. Issues addressed

143. The Kuwait Action Plan (KAP) Region is one of the world's most valuable marine environments. It is also characteristic that all States of the region are faced with very similar environmental concerns. On the one hand, high rates of evaporation and shallow coastal waters and on the other, rapid economic development, combine to make this a high risk area.

144. The greatest single threat is, of course, oil pollution. About 57% of the known world oil reserves and 82% of the OPEC reserves belong to the KAP countries. Almost two thirds of all the petroleum carried by ships is exported from this region. Given this constant and massive movement in crude oil and petroleum products, accidents are inevitable. It is forecasted that, discounting ballast pollution and oil spillages, in excess of one and a half million metric tonnes of oil will pollute the Gulf during the remainder of this decade.

145. The second biggest environmental threat in the region is pollution from land-based sources. Industrial development on the KAP Region has come all at once. Some 20 major industrial centres are being developed, virtually all located on the coast. Activities of new industrial programmes consist of petrochemical development, including gas gathering and processing, aromatic complexes, oil refineries and gas liquefaction plants, fertilizer plants, aluminium smelters, iron copper and steel complexes, cement plants, water desalination plants, and other industries.

146. Only a tiny fraction of total investment has gone to pollution prevention. So far, no State of the region has established integrated programmes of pollution control. It is estimated that 75% of all sewage goes into the sea untreated.

147. The per capita loads of solid wastes produced by industrial plants in the KAP region are, already, higher than the average of the developed countries. In two countries they are more than double the specific amounts estimated for the industrialised OECD countries.

148. Drastic population increase has placed a considerable burden on the coastal areas of the KAP countries. Population concentration on the coast, along with industrial development have also increased the need for expanded port and marine terminals and facilities. Near-shore areas have become the dumping sites for waste created by both increased industrial activities and population. The demographic trend in the coastal areas is inclining toward congestion and concentrated population growth. Consequently these affect the land-use patterns thus placing a strain on coastal resources.

149. Coastal infilling and other human activities have an adverse impact and often lead to a complete destruction of critical marine habitats such as mangroves and associated intertidal flats. Once reclaimed, the habitat loses its former high biological productivity and becomes virtually barren. Coastal infilling also extends to the shallow sublittoral, and has already degraded extensive areas of seagrass which represents another critical habitat. Continued habitat degradation is likely to lead to significant loss of the natural resources (e.g. shrimp - and fin - fisheries) reliant on these habitats.

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<sup>10/</sup> Extracted from documents RSRS 35, ROPME CM3/6 and other reports.



150. Extensive dredging along the Gulf coast has greatly increased sedimentation. The primary effects are direct smothering or clogging of organisms such as corals and seagrass. Serious damage, or even complete loss, of these habitats has now been observed in many areas. Sedimentation also increases the water turbidity, which in turn impairs photosynthesis and hence productivity of seagrass, reef corals and other marine species.

151. Increased recreational visits to offshore islands are likely to disturb the island fauna and impair breeding. Reef deterioration may also result from increasing pressure from diving.

#### B. The Kuwait Action Plan

152. Regional co-operation in the protection and development of the marine environment in the Kuwait area was the first to be initiated among all other regions of the Indian Ocean. The relatively rapid progress it has made and the essential independence from UNEP it has achieved must in part at least be a reflection of the similar rapid state of development of the eight States involved and the ready availability of funding within the region.

153. The first step towards the development of an Action Plan for the region was a fact-finding mission organized by UNEP and co-sponsored by the United Nations, UNIDO, UNDP, FAO, UNESCO, WHO and IMO, which visited the eight states concerned during 1976. The objective was to identify and define environmental problems of the region with a view to the development of an Action Plan, as requested by the Governments of the region through the UNEP Governing Council.

154. Proposals for the elements to be included in the action plan were developed by four UNEP-sponsored meetings during 1976 and 1977. The first was an inter-agency meeting, involving the United Nations bodies mentioned above, with the addition of IOC, UNCTAD and WMO, at which the first draft of an action plan prepared by UNEP was reviewed. This was followed by three meetings of experts from the region which reviewed and revised the drafts of the action plan, of a regional convention and of a protocol on co-operation in pollution emergencies.

155. The Kuwait Regional Conference of Plenipotentiaries on the Protection and Development of the Marine Environment and the Coastal Areas was convened by UNEP in 1978. The Conference adopted the action plan, the Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment from Pollution, and the Protocol concerning Regional Co-operation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency. Interim institutional and financial arrangements for the implementation of the action plan covering the first two years of its operation were also agreed upon. The action plan takes account of the marine science needs and planned programmes identified by the 1976 Consultation meeting in Rabat. The Convention together with the Protocol were ratified by each of the Contracting States during the period 1979-81.

156. The Action Plan in general terms follows the structure and sets the overall goals adopted by other co-operative programmes as outlined in the introduction to this report:

- (a) "assessment of the state of the environment including socio-economic development activities related to environmental quality and of the needs of the Region in order to assist Governments to cope properly with environmental problems, particularly those concerning the marine environment;

- (b) development of guidelines for the management of those activities which have an impact on environmental quality or on the protection and use of renewable marine resources on a sustainable basis;
- (c) development of legal instruments providing the legal basis for co-operative efforts to protect and develop the Region on a sustainable basis;
- (d) supporting measures including national and regional institutional mechanisms and structures needed for the successful implementation of the Action Plan."

157. The protection and development of the marine environment and the coastal areas of the Region for the benefit of present and future generations is the central objective of the Action Plan. This Action Plan sets forth a framework for an environmentally sound and comprehensive approach to coastal area development, particularly appropriate for this rapidly developing Region.

158. Following is a general description of the various components of the Kuwait Action Plan. Each component of the Action Plan is followed by a code number in parentheses designating the project and programme derived from it in subsequent meetings.

a. Environmental assessment

159. The co-ordinated regional environmental assessment programme consists of the following component programmes:

- (a) Survey of national capabilities of the Region in the field of marine sciences, including marine meteorology covering:
  - (i) scientific and administrative institutions (KAP project 1/1);
  - (ii) information centres and data sources (KAP project 1/2);
  - (iii) research facilities and equipment (KAP project 1/3);
  - (iv) manpower (KAP project 1/4);
  - (v) existing environmental laws and regulations (KAP project 1/5);
  - (vi) ongoing and planned activities (KAP project 1/6);
  - (vii) publications (KAP project 1/7).
- (b) Assessment of the origin and magnitude of oil pollution in the Region comprising:
  - (i) baseline studies on the sources, transport and distribution of oil and petroleum hydrocarbon pollution in the Region (KAP project 2/1);
  - (ii) physical, chemical and biological oceanography of the Region relevant to the transport, distribution and fate of oil as a pollutant (KAP project 2/2);
  - (iii) marine meteorology relevant to the transport and distribution of oil as a pollutant (KAP project 2/3).
- (c) Assessment of the magnitude of pollutants affecting human health and marine ecosystems of the Region consisting of:
  - (i) survey of land-based sources of industrial and municipal wastes discharged directly or indirectly into the sea or reaching it through the atmosphere (KAP project 3/1);

- (ii) studies on the impact of industrial and municipal waste, including microbiological agents, on human health (KAP project 3/2);
  - (iii) research on effects of pollutants and other human activities, such as dredging and land reclamation, on important marine species, communities and ecosystems (KAP project 3/3);
  - (iv) baseline studies and monitoring of the levels of selected pollutants, in particular heavy metals, in marine organisms (KAP project 4/1).
- (d) Assessment of factors relevant to the ecology of the Region and the exploitation of its living resources including:
- (i) biology of commercially important species of crustaceans, molluscs and fish in the Region, including their stock assessment (KAP project 4/1);
  - (ii) plankton productivity and distribution in the Region (KAP project 4/2);
  - (iii) ecological studies of important natural habitats in the intertidal and subtidal zones, including creeks (khores) in the Region (KAP project 4/3).
- (e) Assessment of geological processes such as sedimentation contributing to, or modifying, the fate of pollutants in the Region, and their impact on human health, marine ecosystems and human activities, as well as effects of coastal engineering and mining (KAP project 5).

b. Environmental management

160. The countries of the Region have experienced unprecedented rates of growth during recent years; particularly in areas such as urbanization, industrialization, agriculture, transport, trade and exploration and exploitation of the Region's resources. Continuous socio-economic development can be achieved on a sustainable basis only if environmental considerations are taken into account. To achieve these objectives the following activities were selected:

- (a) Preparation and up-dating of a directory of Government-designated institutions available in the Region and active in fields related to the environmental management components of the Action Plan (KAP project 6).
- (b) Assessment of present and future development activities and their major environmental impact in order to evaluate the degree of their influence on the environment and to find appropriate measures either to eliminate or reduce any damaging effects they may have (KAP project 7).

161. Furthermore, in view of the priorities and needs of the Region, the following co-operative programmes relevant to the management of regional environmental problems stemming from national development activities were chosen to be undertaken:

- (c) Identification of the most relevant ongoing national, regional or internationally supported development projects which have beneficial environmental effects such as the various fisheries projects of FAO, the environmental sanitation activities of WHO, and the assistance in industrial waste treatment provided through UNIDO. The most significant of these projects should be strengthened and expanded to serve as demonstrations and training sites on a regional basis (KAP project 8).

- (d) Formulation of regional contingency plans for accidents involving oil exploration, exploitation and transport, and strengthening the meteorological services contributing to the development of contingency plans and to their execution in co-ordination with existing or future marine regional meteorological programmes (KAP project 9).
- (e) Assistance in development of national capabilities in engineering knowledge needed for regional environmental protection (KAP project 10).
- (f) Strengthening the national public health services and their co-ordination whenever transboundary interests require it (KAP project 11).
- (g) Rational exploitation and management of marine living resources, including aquaculture, on a sustainable basis, and the establishment of protected aquatic and terrestrial areas, such as marine parks, wetlands and others (KAP project 12).
- (h) Co-ordination of marine and land transport activities and the creation of a regional transport co-ordinated programme with special emphasis on port-generated pollution (KAP project 13).
- (i) Development of principles and guidelines for coastal area development and management through workshops (KAP project 14).
- (j) Co-ordination of national water management policies including community water supply and water quality control, whenever they may have an impact on the marine environment of the Region (KAP project 15).
- (k) Upkeep of records of oil pollution incidents in the Region with relevant information on the impact of such pollution on the marine environment (KAP project 16).

c. Legal component

162. The legally binding documents signed in Kuwait in April 1978 are:

- (a) The Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment from Pollution, and
- (b) The Protocol concerning Regional Co-operation in Combating Pollution by Oil and other Harmful Substances in Cases of Emergency.

163. Furthermore, it is recommended that UNEP should, in co-operation with the Governments and United Nations bodies concerned, convene intergovernmental groups to prepare additional protocols which will include:

- (a) scientific and technical co-operation;
- (b) pollution resulting from exploration and exploitation of the continental shelf and sea bed and its subsoil;
- (c) development, conservation, protection and harmonious utilization of the marine living resources of the Region;
- (d) liability and compensation for damage resulting from pollution of the marine environment;

(e) pollution from land-based sources.

164. Aware of the need to give protection to the Region against pollution from the ships through normal operations or dumping activities, an appeal is made to Governments of the Region to strengthen the measures for the protection of the Region through ratification and implementation of the relevant international conventions, particularly:

(a) 1954 International Convention for the Prevention of Pollution of the Sea by Oil, and its amendments;

(b) 1972 Convention on Prevention of Marine Pollution by Dumping of Wastes and Other Matter;

(c) 1973 International Convention for the Prevention of Pollution from Ships as modified by the Protocol of 1978.

d. Institutional arrangements

165. In establishing institutional arrangements for carrying out the Action Plan, it was agreed that a mechanism should be established which uses, to the greatest possible extent, the national capabilities available in the Region and the capabilities of existing international organizations and co-ordinating bodies and which would deal with national institutions through the appropriate national authorities of the States concerned. Where necessary, national institutions should be strengthened so that they may participate actively and efficiently in the various programmes.

166. The Regional Convention establishes a specific Regional Organization for the Protection of the Marine Environment (ROPME), consisting of a Council which is comprised of the Contracting States, a secretariat and a Judicial Commission for the Settlement of Disputes.

167. The Action Plan called on UNEP to make such interim arrangements as were required for the achievement of the objectives of the Action Plan, including the establishment of an interim secretariat until the permanent Regional Organization for the Protection of the Marine Environment was established.

168. The Governments of the Region further agreed to the establishment of a Marine Emergency Mutual Aid Centre (MEMAC), which operates under the supervision of ROPME. The Centre has primarily a co-ordinating role in exchange of information, training programmes and monitoring. The possibility of the Centre initiating operations to combat pollution by oil and other harmful substances will be considered at a later stage in accordance with the relevant articles of the Protocol concerning Regional Co-operation in Combating Pollution by Oil and other Harmful Substances in Cases of Emergency.

e. Financial arrangements

169. The Conference agreed to establish a Regional Trust Fund to cover the costs of the interim secretariat and of implementing the Action Plan. It was decided that the Regional Trust Fund would be financed by proportional contributions from the Governments and by a contribution by UNEP. It was further requested that the Executive Director of UNEP assume responsibility for administering the Regional Trust Fund in the interim period prior to the establishment of ROPME.

f. Supporting measures

170. The Action Plan calls for an intensive training programme to be formulated in the early plans of its implementation. Further, under the heading of "environmental management" two major supportive measures were foreseen in the Action Plan:

- (a) It was agreed that a extensive training programme should be developed for personnel from the Region. Such a programme would be executed through training at existing national, regional or international institutions ready to offer their facilities.
- (b) It was further agreed that, as marine and coastal area environmental protection and enhancement cannot be achieved without the full support and co-operation of all those concerned, adequate resources should be devoted to systematic and regular campaigns for public awareness of environmental issues in the region (KAP project 17).

Progress achieved

171. For the implementation of this Action Plan projects and programmes derived from it were designated and grouped according to similarity and thematically into four groups, as follows:

Group (A): KAP 1/1, 1/2, 1/3, 1/4, 1/5, 1/6, 1/7  
KAP 2/3  
KAP 3/1  
KAP 6  
KAP 7 Phase 1 only

Group (B): KAP 2, excluding 2/3  
KAP 3, excluding 3/1  
KAP 4/2, 4/3  
KAP 5

Group (C): KAP 7, only phase 2  
KAP 8  
KAP 10  
KAP 13  
KAP 14

Group (D): KAP 4/1  
KAP 11  
KAP 12  
KAP 15

172. Through several successive meetings, operational details of each programme were developed by experts nominated by the Governments of the Region, in co-operation and co-ordination extended by UNEP and the relevant UN Organizations and agencies.

173. Several projects of Group A were carried out and completed by a multidisciplinary mission during the interim period, before ROPME was set up. Projects of this Group included surveys and preparation of inventories and directories of management resources in the region (such as Marine Research Centres, existing environmental laws and regulations, government designated institutions, bibliographies) and a feasibility study for the establishment of a computerized information and data exchange system.

174. Projects of Group B consist of activities related to oceanography and to the assessment of marine pollution of the region through monitoring and research. Through ROPME co-ordination, two task teams were set up for the execution of the projects. A task team on Oceanography and a task team on Baseline Studies of Oil and Non-Oil Pollutants. These projects have culminated in a three year monitoring programme running through the end of 1985. The programme includes ecological surveys of selected coastal areas, training workshops on oceanographic modelling, uses of regional manuals, intercalibration, sampling and analysis of pollutants in selected marine organisms and coastal waters, and training of scientists and technicians in sampling and analytical techniques.

175. Further activities by ROPME include a study on reception facilities which is expected to lead to measures for the installation of reception facilities in the region.

176. Projects of Group C and D categories related to environmental management have not yet been initiated. The formulation of other Task Teams has also been deferred to a later phase.

177. The institutional and financial arrangements provided for by the Convention and implemented since, are as follows:

178. For a two-year interim period UNEP acted as the interim co-ordinator of the Action Plan. ROPME was officially established in Kuwait in 1981 taking over full responsibilities of co-ordination of the Action Plan from UNEP. The Regional Organization is however in full co-operation with UNEP which continues to support the further development and implementation of the Action Plan.

179. A Regional Trust Fund was immediately established to cover the costs of implementing the Action Plan, and UNEP was entrusted with its management.

180. The Marine Emergency Mutual Aid Centre (MEMAC) sharing the responsibility with ROPME for the implementation of the Protocol was established in 1983 in Bahrain. Its primary objective is to develop a regional contingency plan in co-ordination with national plans and surveillance programmes, and to mobilize and co-ordinate resources on a regional as well as national scale for dealing with pollution in cases of emergency. Of particular interest is the fact that the setting up of MEMAC coincided with the Nowruz Oil Field blow-out. For many months between two and ten thousand barrels of crude oil per day poured into the sea, posing a significant threat to natural ecosystems, fisheries, coral reefs and to industrial installations with sea-water intakes. MEMAC was instrumental in formulating a programme for dealing with the spill, its clean-up and its after effects, thus paving the way for the efforts to deal with the aftermath of the spill.

181. In relation with the programmes of Group B activities several training workshops have already been held. One workshop dealt with the practical aspects of oceanographic sampling and another on laboratory oriented analytical procedures. A symposium was organized on mathematical modelling of the oceanographic conditions of the Region, and the training courses were conducted for technicians from the Region.

182. With respect to Environmental Awareness (KAP 17) a meeting on public awareness activities was convened by UNEP in Muscat, in December 1981. Based on the recommendations of the meeting a regional task team was recently formed to propose specific programmes and activities on public awareness.

### The future

183. As would be expected, regional co-operation under the Kuwait Action Plan in this brief period of its existence, has centered around those environmental issues that are present in a most urgent manner. Dealing with pollution control, especially from oil, is the most acute problem in the region. This priority is reflected in the single protocol that has been adopted, in the establishment of MEMAC and in the monitoring programme carried out as the first part of the implementation of the Action Plan. Nevertheless, another five recommended additional Protocols are to be prepared. As a result of the acknowledgement that the next biggest threat to the region is pollution from industrial development and population concentration in the coastline, priority was given to the Protocol on Pollution from Land-Based Sources. In parallel, an indepth study of Land-Based Sources of Pollution has been launched.

184. KAP is actively pursuing co-operation with relevant international agencies as well as with other regional authorities. The third meeting of the ROPME Council has proposed the increased involvement from KAP Region in the Regional Seas Programmes of Eastern Africa, South Asia and the Red Sea and Gulf of Aden since the waters of these four regions constitute the major part of the Indian Ocean basin. Ways and means are also being sought for promoting and strengthening inter-Arab co-operation in the field of the protection of the marine environment among Arab States which are now Contracting participating members or Parties to five different Regional Conventions.

#### 4. The South Asian Seas Region<sup>11/</sup>

##### A. Issues addressed

185. Environmental problems in the coastal and island States of South Asia are many and diverse. They are present in varying degrees of concern, in some states pollution dangers being more prominent while in others the fragility of the coastal ecosystem.

### The land/ocean interface

186. Land/ocean systems interact in this area in a dynamic way. This ongoing, but sometimes abrupt, natural process, brings the coastal ecosystem to continuously new, if fragile, states of balance. Sometimes these processes are disastrous not only for the natural environment but also to man. Only in Bangladesh in the last 20 years about 390,000 people have lost their lives in 28 cyclones accompanied by tidal waves that have swept the coast.

187. Vast areas of the subcontinent and the Himalayan Mountains are drained into the ocean through numerous rivers. Enormous quantities of silt are deposited at river mouths forming deltaic islands which eventually become permanent with their colonization by pioneering mangrove species and terrestrial vegetation. In Bangladesh 2-3 billion metric tonnes of silt are brought down by a 50,000 mile long river system. New islands of over 4,000 square kilometres have been formed in recent times.

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<sup>11/</sup> Extracted from documents UNEP/WG.105/3 and 4, and SACEP Reports of Intergovernmental Meetings.



188. Sand occurs along the sea face of deltaic regions, where the surge and turbulence prevent deposition of fine clay. Tides bring up quantities of sand from the ocean floor and deposit it on exposed coasts as sandbanks. This sand is then driven inland by strong winds that blow from the ocean. On the lee side of these sandbanks tidal creeks establish and silt deposition begins finally establishing an island. Frequent flooding continually fertilizes the surface of this area by carrying away old soil and bringing in new soil, thus facilitating the establishment of pioneering vegetation.

#### Production potential of newly emerged land

189. Efficient use of this newly emerged land is a high priority in the region. Very often, as new land is formed on actively prograding foreshores, land-hungry people place their cattle on it, delaying consolidation and vegetation progression.

190. Understanding the complex ecological inter-relationships between the land and sea and developing social controls are considered necessary to make the best use of this resource.

#### Mangrove management

191. Mangrove forests developing on deltaic land and islands have a key role in the coastal environment as a coastal protection, as a regulator of the coastal ecosystem, as a rich biological habitat which can be managed for enhancement, and as a productive forest resource which can be managed on a sustainable basis. It is noteworthy that in Bangladesh, no less than one third of the population depend in one way or another on mangrove forests for their livelihood. Mangrove management and conservation is a high priority issue throughout the region.

#### Land stability

192. Natural phenomena and human activities having adverse effects on the stability of the coast are also of great concern and they include:

- (a) erosion of the coastline, particularly during high storm conditions;
- (b) the natural continuing movement of coral sand in small island situations;
- (c) the effects of indiscriminate excavation and removal of gravel from river beds and of sand from the coast;
- (d) the effects of silt discharges from rivers draining cleared lands, following changes of land use or changes of vegetative cover, this causing excessive sedimentation at the coast thus destroying coral reefs, estuary bottoms and marine organisms. These effects may thus extend far out into the ocean well beyond the actual sedimentation.

#### Development of marine protection

193. All the countries of the region have large numbers of people living close to the sea and making their living from the coasts. Fishing is a major source of livelihood. In the Maldives fish exports account for 90% of the country's total exports. Although there is a big variety of conditions in the water environment of the region, fishery management principles as well as aquaculture and mariculture development can have regional application.

### Coral management

194. The management of coral ecosystems also constitutes a major environmental concern for the region, especially for the Maldives and St. Martin's Island, being the sole constituent of land on which the people live. The major causes of coral reef damage in the region are identified as coral mining and the use of explosives for fishing, together with the effects of excessive sedimentation, and in some areas, predation by the "Crown of Thorns" starfish.

### Management of island ecosystems

195. Island ecosystems, though forming only a small portion of the total region, are especially dependent on careful management.

196. Three main island types could be recognized in the South Asian region:

- (a) Oceanic islands of coral origin such as Maldives and Lakshadweep with highly specialized ecosystems that provide the feeding and breeding grounds for a number of marine animals;
- (b) Continental islands such as Sri Lanka and Andamans which usually were connected with continental land masses in the past and have general continental characteristics and continental ecosystems except for a narrow coastal belt; and
- (c) Deltaic islands of Bangladesh and India which are formed by heavy sedimentation and are usually of recent origin, temporary and fast changing until stabilized by vegetation cover.

197. Both remoteness and size mould the characteristics of the island ecosystems. Increasing remoteness facilitates establishment of exotic biota, as biological interference from outside decreases. Decreasing size lays limitations on land and other resource availability, which also determines the suitability of these islands for human inhabitation. Space limitations also make the environment more vulnerable to damage and it therefore becomes crucially important to preserve the ecosystem from undue disturbance. In the case of deltaic islands, it is also necessary not to disturb the natural processes of biotic establishment by pioneer species.

### Land-based pollution

198. Pollution from industrial and domestic effluents though localized, may be serious in the region. Especially prominent is pollution in the coastal areas around Bombay, the Manora Channel and the Hyari River in the Karachi area, and the shore near Colombo. Surveys of the Madras coast have revealed considerable contamination of shellfish and zooplankton. The shallow waters of the Bay of Bengal are very sensitive to any sources of pollution. More diffuse pollution from agricultural production can have widespread, though less spectacular effects on the quality of coastal waters.

### Sea-based pollution

199. Oil spills from marine accidents, ship discharges and tank washings, from dumping at sea, are a serious threat to the region especially in the northern part of the Arabian Gulf, around major ports and along major sea-routes.

Protection of coastal ecosystems and endangered species

200. A great deal of attention has been given to conservation of marine mammals in the Indian Ocean during recent times. The entire Indian Ocean North of 55 degrees South was declared a Cetacean Sanctuary. The declining population of dugongs has been also observed.

201. Some of the countries of the region are giving priority to the establishment of marine reserves to preserve typical or specially significant ecosystems and species of the Indian Ocean in as near to pristine condition as possible.

202. The preservation of gene pools is also seen as a responsibility which is more effectively handled on a regional than a national basis.

B. Co-operation towards an Action Plan

203. At the South Asia Co-operative Environment Programme Intergovernmental Expert group meeting held in Bangalore, India 10-15 March 1980, it was agreed to establish in Sri Lanka the South Asia Cooperative Environment Programme (SACEP). The meeting also identified the broad areas in which co-operation was urgently necessary and possible and the different countries which agreed to be focal points in those areas.

204. The articles of association, programme modalities and functions of each focal point and of the Coordinating committee of SACEP were worked out by a High Level Meeting of Officials in Colombo, Sri Lanka, on 18-21 February 1981. This meeting was immediately followed by a meeting of South Asia countries which adopted the Declaration on Establishment of the South Asia Cooperative Environment Programme and approved the Articles of Association of SACEP.

205. The contracting parties to SACEP were Afghanistan, Bangladesh, India, Iran, Maldives, Pakistan and Sri Lanka. Other countries of South Asia were invited to participate by adopting the Declaration and approving the articles of association.

206. A broad policy guidance and general directions of work were decided, on the basis of which selected priority items were identified for implementation by the focal points and the SACEP Secretariat. The main subject areas selected were as follows:

(a) Environmental management

- (i) Environmental Impact Assessment and cost/benefit analysis; environment and development
- (ii) Environmental quality standards
- (iii) Technology for development of renewable and reusable resources
- (iv) Environmental legislation

(b) Management of natural resources

- (i) Conservation of montane ecosystems and watersheds
- (ii) Social forestry
- (iii) Regional co-operation in wildlife and genetic resources conservation
- (iv) Conservation of corals, mangroves, deltas, coastal areas
- (v) Island ecosystems
- (vi) Tourism and environment

(c) Desertification

(d) Regional Seas Programme

(e) Energy and Environment

- (i) Technology for alternative sources of energy
- (ii) Evaluation of alternative sources of energy use, energy planning and energy preparation to environment and development

(f) Education and training

- (i) Environmental education and training
- (ii) Training in wildlife management

207. In May 1982 the UNEP Governing Council authorized the Executive Director of UNEP to enter into consultations with the concerned states regarding the establishment of a regional seas programme in the South Asian Seas. This was followed by a series of actions which led to a meeting of national focal points of the States of the region, convened by the Executive Director of UNEP in co-operation with SACEP in March 1984. The purpose of the meeting was to seek the views of interested parties on how to proceed in developing a comprehensive action plan for the protection and management of the marine and coastal environment of the South Asian Seas region. The states involved were the coastal member states of SACEP (Bangladesh, India, Maldives, Pakistan and Sri Lanka).

208. With respect to the content of the action plan under development it was considered that it should address the environmental concerns of the participating States. Of those, pollution from human settlement and industrial sources and the threat of oil pollution, although to varying degrees, is of common concern to most of the states while degradation caused by sedimentation is of lower priority. Management of mangrove, coral and island ecosystems are of primary concern to some of the States. The protection and management of special areas was also highlighted.

209. On the basis of the above a consensus was reached that the following priority areas of regional concern should be considered in the further development of the action plan:

a. Environmental assessment

210. The assessment component would concentrate on monitoring pollution from human settlements; oil pollution from coastal and maritime sources; pollution from agricultural activities (pesticides, fertilizers); pollution from industrial sources, including toxic and noxious substances and environmental degradation resulting from other causes, such as coastal erosion and sedimentation.

b. Environmental management

211. The management and conservation component would consist in general terms of coastal zone management; marine ecosystems management; the conservation of endangered and threatened species; the creation of marine parks, reserves and sanctuaries; and the consideration of environmental aspects of renewable sources of energy from the sea.

c. Legal component

212. The relationship between the countries of the broader region are agreed upon within the framework of the Articles of Association of SACEP. Matters concerning a convention and related protocols may be considered at a later date. UNEP has

undertaken to prepare a document addressing environmental legislative aspects relevant to the action plan.

d. Institutional arrangements

213. It was agreed that UNEP would co-ordinate preparation activities leading to the adoption of the action plan, in close collaboration with SACEP, and with the co-operation and assistance of international organizations as appropriate. Decisions on the permanent arrangements (secretariat of the action plan, supervisory and decision making bodies and/or meetings) will be taken at the adoption of the action plan.

e. Financial arrangements

214. UNEP is assisting the States of the South Asian seas region in activities leading to the development of the action plan. Upon its adoption however, the Governments of the region will progressively assume full financial responsibility for its implementation. Contributions in kind and services are also expected from Governments through participation of their national institutions and experts in projects carried out within the framework of the action plan.

f. Supporting measures

215. Other supportive measures include:

- (a) Information exchange, data banks, clearing house;
- (b) education, training and development of human resources (evaluation of needs reflecting the requirements of the action plan);
- (c) promotion of environmental awareness;
- (d) consideration of essential legislative aspects relevant to the action plan;
- (e) other priority areas that may be defined at a later stage.

Future action

216. An intergovernmental meeting to consider the adoption of the action plan is scheduled to take place. This meeting would be preceded by meetings of experts and of national focal points to review documents and proposals.

5. The East Asian Seas Action Plan<sup>12/</sup>

217. At its 1977 meeting the Governing Council of UNEP took note of the interest manifested by the Governments of Indonesia, Malaysia, the Philippines, Singapore and Thailand in developing a programme for the protection and management of their seas and decided to initiate steps to "formulate and establish a scientific programme involving research, prevention and control of marine pollution and monitoring" for the East Asian Seas Region (Governing Council Decision 88(V) of 25 May 1977).

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<sup>12/</sup> Reference documents: RSRS No. 24, UNEP/IG.26/6, UNEP/IG.31/6, UNEP/IG.37/10, UNEP/IG.44/4 and 11, UNEP/IG.52/3,4, and 10, and UNEP/IG.62/4.

218. In accordance with this decision, the Executive Director of UNEP in co-operation with ESCAP, FAO, UNESCO, IOC of UNESCO, WHO, IMO and IAEA initiated the preparatory work needed to develop an Action Plan for the protection of the marine environment of East Asia.

219. The programme, which involved many background studies, meetings and consultations, culminated in the convening of two intergovernmental meetings which formally adopted the Action Plan for the Protection and Development of the Marine Environment and Coastal Areas of the East Asian Region.

220. The first intergovernmental meeting, held in Manila, 27-29 April 1981, finalized the content and agreed to the environmental assessment and environmental management components of the Action Plan and requested that the Executive Director of UNEP prepare with the collaboration of the relevant international organizations, as appropriate, detailed draft description(s) of the projects to be developed on the basis of the established priorities.

221. The second Intergovernmental Meeting on the East Asian Seas Action Plan was convened by the Executive Director in Bangkok, 9-11 December 1981. The meeting reviewed the programme priorities of the Action Plan, the timetable for their implementation as well as the institutional and financial arrangements needed to support it.

222. The meeting decided that "overall authority to determine the content of the Action Plan, to review its progress and to approve its programme of implementation, including financial implications, would be vested in the regional periodic meetings of Governments (intergovernmental meetings) participating in the Action Plan". For this purpose a policy co-ordinating body known as the Co-ordinating Body on the Seas of East Asia (COBSEA) was formed. The overall technical co-ordination of the Action Plan was vested in UNEP. The meeting also decided that each of the national focal points will be responsible for the implementation and co-ordination of one or several priority projects.

223. Financial resources were pledged by the governments to the Trust Fund. The UNEP Executive Director pledged an allocation of counterpart funds in cash and in kind from UNEP.

224. Subsequent to the Second Intergovernmental Meeting, the first meeting of COBSEA was held in Bangkok, 3 April 1982, and allocated funds to the agreed priority projects for 1982.

225. Since then, regular meeting of COBSEA held in April every year have reviewed the implementation of the Action Plan and the progress of the priority projects.

226. There has, of course, been a series of other meetings leading to the adoption of the Action Plan. In order to give an idea of the complexities and of the number of problems which have to be solved before deciding on the form of an Action Plan these have been attached to this report (Annex IV).

227. The principal objective of the Action Plan is the development and protection of the marine environment and the coastal areas for the promotion of the health and well-being of present and future generations. The action plan is intended to provide a framework for an environmentally-sound and comprehensive approach to coastal area development particularly appropriate to the needs of the region.

228. The Action Plan is aimed at achieving the following :

- (a) assessment of the state of the marine environment, including assessment of the effects of marine, coastal and other land-based activities on environmental quality, so as to assist Governments to cope properly with marine environmental problems;
- (b) management of those marine and coastal development activities which may have an impact on environmental quality or on the protection and use of renewable marine resources on a sustainable basis;
- (c) development of suitable co-ordinating measures for the successful implementation of the Action Plan.

229. All components of the Action Plan are interdependent and provide a framework for comprehensive action which should contribute to both the protection and the continued development of the region. No component will be an end in itself. Each activity is intended to assist the Governments of the region in improving the quality of the information on which environmental management policies are based.

230. The programme arising from the Action Plan should contribute not only to resolving environmental problems commonly faced by the participating States, but should also strengthen co-operation in other related areas of interest as reflected in, inter alia, the Conference on Technical Co-operation among Developing Countries (TCDC), the United Nations Conference on the Law of the Sea, the UNDP/CCOP Project on Regional Offshore Prospecting in East Asia, the South China Sea Fisheries Development and Co-ordinating Programme and IOC Working Group for the Western Pacific (WESTPAC). In addition, full account should be taken of the policies and interests of the States as expressed in various regional and sub-regional organizations, and in particular, in the ESCAP, IPFC, South East Asian Fisheries Development Center (SEAFDEC) and ASEAN, including its ASCOPE Expert Group on Marine Pollution, and the ASEAN Experts on the Environment.

231. The action plan is implemented primarily through national and regional institutions of the participating States by way of co-ordinated national sub-regional and regional activities. To achieve this goal, an intensive training programme was carried out supporting the development of the Action Plan.

232. A general description of the various components of the Action Plan is given in the following paragraphs.

a. Environmental assessment

233. Environmental assessment is one of the basic activities that will underlie and facilitate the implementation of the other components of the Action Plan. Priority is given to the identification of the present quality of the marine environment and the coastal areas, the factors currently affecting its quality and the projection of future trends. Owing to the inadequacy or incomparability of available data on the marine environment, a co-ordinated basic and applied regional marine science programme is formulated as a first step toward the protection of the marine environment of the region.

234. Taking into account the preparatory activities undertaken and, in particular, the Directory of Indian Ocean Marine Research Centres, further baseline information includes the following:

- (a) - Survey of national capabilities and activities in the region as they relate to the marine environment and coastal area development. The information gathered is being disseminated in the form of a directory of scientific institutions, research centres, information centres and data sources; a compendium of complete, on-going and planned research work and scientific studies; and a bibliography of publications and reports published on relevant problems of the region.
- (b) compilation and up-to-date synthesis of existing data on the physical oceanography of East Asian waters utilizing physical and chemical oceanographic information collected during the past two decades by various national data centres in the Pacific region, through projects executed in the area, and by international organizations concerned.

235. Taking into consideration the recommendations made by the ASEAN experts on the environment and other regional groups and meetings, the following components are included in the co-ordinated environmental assessment programme:

- (a) Assessment of the oceanographic phenomena including detailed oceanographic surveys with special emphasis on the observation of maritime meteorological phenomena and their influence on water movements; the study of oceanographic features with emphasis on hydrography, water masses, water circulation and their effects upon pollution dispersion patterns; and the establishment of oceanographic reference stations.
- (b) Assessment of oil pollution and its impact on living aquatic resources, including a survey of oil pollution sources and monitoring of oil pollution in the marine and coastal environment; and co-operative research on oil and oil dispersant toxicity.
- (c) Assessment of non-oil pollutants, especially metals, organics, nutrients and sediments, and their environmental impact, including a survey of rivers and of land-based sources of pollution; a study of concentration levels and trends; and a study of pollution effects on the marine environment.
- (d) Assessment of the impact of pollution on, and habitat degradation of, mangrove and coral ecosystems, including a survey of the state of mangrove and coral resources and a study of the effects of pollutants and destructive factors on mangrove and coral communities and related fisheries.

236. Priority is assigned to the components listed in the preceding paragraph. For the possible future expansion of the environmental assessment programme, the following components may be considered:

- (a) assessment of the environmental impact of offshore seabed exploration and exploitation, including petroleum, mining and dredging;
- (b) assessment of thermal pollution in coastal waters and its impact on marine biota;
- (c) assessment of the nature and magnitude of pollution reaching the marine environment through the atmosphere.



237. A holistic and interdisciplinary approach to the study of marine and coastal ecosystems is envisaged. To this end, and to the extent feasible; participating States will identify and designate pilot areas for the co-ordinated implementation of the assessment projects listed above.

b. Environmental management

238. Continuous socio-economic development can best be achieved on a sustainable basis if environmental considerations are taken into account. To achieve the objectives of the development and environmental management component of the Action Plan, the following preparatory activities were considered necessary:

- (a) preparation of a directory of institutions in the region active in fields related to environmental management, in conjunction with the survey of national capabilities and activities in the region mentioned above;
- (b) identification of relevant on-going national, regional and internationally supported development projects which demonstrate sound environmental management practices, such as the various projects of UNDP, FAO, WHO, UNIDO and IBRB some of which may usefully be strengthened or expanded to serve as demonstration and training models on a regional basis.

239. Co-operative efforts of the participating States will be marshalled towards the establishment and strengthening of national co-ordinating mechanisms to deal more effectively with environmental affairs and, in particular, pollution problems of the coastal areas. In accordance with the priorities of participating States the following projects will be undertaken:

- (a) Oil pollution control, including support programmes for national and regional contingency planning, investigative activities for curbing pollution from ships and establishment of regional advisory services in support of national pollution control activities;
- (b) Pollution control and waste management including the development of guidelines for waste disposal in coastal waters and co-operative investigation for marine sites for dumping hazardous wastes;
- (c) Development and/or strengthening of national co-ordinating mechanisms for the management of relevant information and data, leading to the subsequent establishment of a regional exchange system.

240. Environmental Impact Assessment of coastal area development and activities concerning marine conservation may be implemented under other regional environmental programmes.

c. Legal component

241. There is no provision in the South Asian Seas Action Plan for a Convention or other legal instruments of enforcement. This was not considered necessary because the Action Plan does not have components the implementation of which would necessitate specific action or would impose restrictions in the activities of participating countries (such as prohibition of dumping, emission standards etc).

242. Furthermore, since the countries presently participating in the Action Plan are members of the ASEAN group which already encompasses some contractual obligations and already has an environmental infrastructure with an Expert Group on Marine Pollution, Experts on the Environment, etc.

243. Notwithstanding the arrangements mentioned above, other countries of the region could join at a later stage in the activities of the Action Plan.

d. Institutional arrangements

244. Policy guidance and co-ordination, reviews of the Action Plan and of its programme of implementation, is vested in the regular, periodic meetings of governments (intergovernmental meetings) participating in the action plan. For this purpose, the participating governments proceeded with the formation of a co-ordinating body to be known as the Co-ordinating Body on the Seas of East Asia (COBSEA). COBSEA makes policy decisions concerning all substantive and financial matters related to the Action Plan and in particular:

- (a) reviews the progress achieved in implementing the programme;
- (b) evaluates the results achieved;
- (c) adopts the work plan for the future implementation of the programme; and
- (d) approves the budgetary resources required to support the workplan.

245. Overall technical co-ordination has been assigned to UNEP by the Governments participating in the Action Plan, as well as the supervision of the necessary groundwork in the initial phase. As the technical co-ordinator for the Action Plan during the interim period UNEP has interpreted its role as being responsible, under the overall policy guidance of COBSEA, for

- (a) providing secretarial assistance and backstopping for activities requested by COBSEA;
- (b) co-ordinating the technical implementation of projects with co-operating agencies and supporting organizations;
- (c) supporting selected activities approved by COBSEA with resources from the Environment fund;
- (d) convening meetings of general nature (COBSEA and others);
- (e) managing the East Asian Seas Trust Fund.

246. For the initial period, the governments have decided not to establish a separate regional co-ordinating unit (RCU) until a later stage when the need arises. A RCU, if established, will be kept small but yet effective in order to maximize the availability of funds for programme activities under the Action Plan.

247. A National Focal Point (NFP) has been designated by each government in all the participating countries. The role of the NFPs will be: to act as the official channel of communication between the Interim Co-ordinator and their respective governments; to co-ordinate, as appropriate, the participation of national institutions and agencies in the agreed programme; and to consult with all relevant organizations within their countries on the activities and progress achieved in implementing the Action Plan.

248. National institutions (NI) (such as research centres, laboratories, government services, universities), designated by each participating government, will provide the institutional basis for carrying out the projects under the action plan. They will be the principal executors of the specific work and research under the Action Plan. NIs will be designated by the NFPs, taking into account the specific characteristics of the national administration and organizational structure of each state.

249. Sub-regional and regional institutions (SRI and RI) are to be used to the maximum possible extent for the implementation or co-ordination of the Action Plan. Where appropriate, NIs are proposed by a State to assume a sub-regional or regional role with the objective of providing services in support of the action plan (such as intercalibration exercises or data collection, collation and dissemination). Technical assistance may be provided through the Action Plan to participating sub-regional and regional institutions.

250. Networking: In principle, several NIs nominated by the NFPs in various States of the region could become participants in any one activity of the Action Plan. The NIs, working on the same activity, are linked in a network of co-operating institutions. RIs and SRIs participating in an activity may also be considered as members of the activity's institutional network.

251. It may be decided by governments that one member of a network may assume the role of a regional activity centre (RAC) for that network and become responsible for co-ordinating the activity for which the network was established.

e. Financial Arrangements

252. Financial support for the activities of the Action Plan may come from :

- (a) contributions from participating governments according to a scale determined by the governments concerned;
- (b) extra contributions from participating governments
- (c) contributions from governments supporting the Action Plan but not participating in it;
- (d) support from any United Nations organization on a project-funding basis;
- (e) support from the regional and international organizations which are not part of the United Nations Systems (e.g. ASEAN) in most cases on a project-funding basis;
- (f) any other source of funding agreed to by the participating governments.

253. Contributions to the Action Plan may be in cash or in kind (staff time, experts, training, facilities, services etc), or both.

254. Ultimately, the Action Plan will be financially self-supporting through the trust fund or some other mechanisms. In the meantime, the Environment Fund of UNEP provides financial support to the Action Plan although this will, over time, decrease as a proportion of the total annual cost.

255. Funding: The participating governments have contributed \$ 86,000 annually in the first years. An increase of approximately 10% is contemplated for later years.

256. UNEP, having agreed to provide the technical co-ordination for the interim period of the action plan, contributes the cost of the technical co-ordination in so far as its own staff and related costs are concerned (estimated at \$ 50,000 per year). In addition, UNEP contributes to programme activities, subject to the availability of funds.

257. A Trust Fund has been established for the management of financial resources and the authority for its administration delegated by the United Nation's Secretary-General to the Executive Director of UNEP. The Trust Fund will therefore be administered according to the financial rules of the United Nations.

f. Supporting measures

258. Training is an important part both of the assessment and the management component of the Action Plan, often in the form of seminars. Some related activities were undertaken even before the launching of the Action Plan. Some of these were regional and national seminars on protection of the marine environment and related ecosystems in Asia and the Pacific (ESCAP/SEPS), 1979/1980; WHO/UNEP Regional Seminar on Environmental Health Impact Assessment, New Delhi, 1979; UN/UNEP Workshop on Coastal Area Development and Management, Manila, 1979; Asian Symposium on Mangrove Environment (UNESCO), Kuala Lumpur, 1980; International Workshop on the Prevention, Abatement and Combating of Pollution from Ships in East Asian Waters (IMCO/UNEP), Manila; Workshop on Environmental Impact Assessment for Water Resource Development Projects, Kanchamburi; UNESCO/IOC Training Course in Biological Oceanography, Cebu City, 1981.

259. The environmental assessment component is to be strengthened through an intensive programme of training and technical support of local scientists and technicians, including:

- (a) standardization of analytical techniques for measuring pollutant concentration, and of techniques used to measure the effects of pollutants on human health, fishery resources and marine and coastal ecosystems;
- (b) introduction of quality control of analytical procedures within and among the laboratories participating in the action plan, including the conduct of regional intercalibration exercises;
- (c) assistance to the laboratories in the field of instrumental analysis through the establishment of a joint regional equipment service;
- (d) training of scientists and technicians through existing national, regional and international institutions ready to offer their facilities;
- (e) compatible methodology for the handling, validation and regional evaluation of data collected through the above research projects.

260. In order to allow for complete and effective participation in agreed activities, technical assistance (such as provision of equipment and training) may be extended through the action plan to strengthen the capabilities of national institutions to participate in the programme.

261. Training in environmentally sound management practices will be provided, including the training of managers and policy makers in such fields as coastal area developing and oil pollution combating.

262. Marine and coastal area environmental protection and enhancement cannot be achieved without the full support and co-operation of all concerned. Therefore, adequate resources should be devoted to systematic and regular campaigns for public awareness of environmental issues in the region.

263. As other support measures, the following activities are to be undertaken in the legal field :

- (a) maintenance by each state of an up-to-date compilation of its national laws relevant to the protection of the marine environment;
- (b) technical assistance and co-operation in the drafting and up-dating of national legislation relevant to the protection of the marine environment.

Priority Projects : Ongoing and future activities

264. Approved projects:

- 1. Oceanography (EAS 1.1, 1.2. and 1.3, reformulated)
  - 1.1. Maritime meteorological phenomena
  - 1.2. Water circulation and pollution dispersion patterns
  - 1.3. Environmental monitoring instrumentation
- 2.1. Survey of sources and monitoring oil pollution
- 2.2. Co-operative research on oil and oil dispersant toxicity
- 3. Assessment of Non-oil Pollutants (EAS 3.2 and 3.3)
- 4. Mangrove and Coral Ecosystems (coral component)
- 7. Information and Data Exchange
- 5.2. Support programme for contingency planning
- 6.2. Marine sites for dumping of hazardous wastes

265. New projects:

- 3.4. Land-based sources of pollution (extension of EAS 3.1)
- 5.1. Training programme for oil pollution control
- 5.3. Operational pollution from ships
- 5.4. Regional advisory services on oil pollution control
- 6.1. Waste discharges into coastal waters
- 4. Mangrove and Coral Ecosystems (mangrove component)

266. Certain activities have already been completed, eg. Bibliography of the Environment : East Asian Seas Directory of Marine Science Institutions of the EAS Region; Manual on procedures for reporting and exchange of oceanographic data (EAS 7.1.); Atlas for marine policy in South East Asian Seas (East West Centre)

267. A series of activities of direct relevance to the Action Plan and the Priority Projects above were conducted or planned. The following are mentioned as examples :

- ESCAP Regional technical workshop on the protection of the marine environment and related ecosystems, Asian Institute of Technology, Thailand, February 1984.
- Drawing up of contingency Plans a) for the Straits of Malacca and.... b) for the Sea of Celebes (IMO).
- UNESCO/UNEP Coral reef workshops, Phuket, February 1984.
- UNESCO (COMAR) Workshop on human impact on coral reefs.
- WESTPAC workshop on organochlorine compounds.
- Workshop on trace metals in biota and sediments.
- ASCOPE Plan for the control and mitigation of oil spills.

It is evident that several of these activities lend themselves for inter-regional co-operation if approval of the organizing agencies can be obtained.

### III. GLOBAL PROGRAMMES<sup>13/</sup>

268. The 1972 Stockholm Conference on the Human Environment defined Earthwatch (the global environmental assessment programme) as one of the three basic components of the Action Plan for the Human Environment. The Governing Council of UNEP subsequently defined Earthwatch as a "dynamic process of integrated environmental assessment by which relevant environmental issues are identified and necessary data are gathered and evaluated to provide a basis of information and understanding for effective environmental management". The Global Environmental Monitoring System (GEMS) is one of the four components of Earthwatch and the "assessment of the state of ocean pollution and its impact on marine ecosystems" was adopted as GEMS' task by the Governing Council of UNEP. The implementation of GEMS is seen by UNEP as a joint undertaking of the relevant United Nations bodies with UNEP serving as focal point for its co-ordination.

269. Following the recommendations of the 1972 Stockholm Conference, and in particular the numerous decisions of the UNEP Governing Council, the monitoring of the quality of the marine environment as a component of GEMS is now implemented through the UNEP Regional Seas Programme. In accordance with the nature of this programme the environmental assessment components of the regional action plans reflect the priorities perceived by the States participating in the individual action plans. Therefore, the monitoring of marine pollutants does not necessarily cover the same substances in every region. In order to provide a global framework for the regional monitoring of pollutants UNEP, in co-operation with relevant specialized United Nations bodies, has developed reference methods for marine pollution monitoring and research (including methods for the assessment of the input from land-based sources to marine pollution), which yield data that are increasingly comparable on a global scale. Likewise, there is a strong emphasis on the intercalibration of sampling and analytical methods as the best means of achieving an adequate quality control of the reported data.

270. A leading role in the assessment of marine pollution problems involving the interest of the United Nations system is played by the IMO/FAO/UNESCO/WHO/WMO/IAEA/United Nations/UNEP Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP). Established in 1969 it serves today:

- to provide advice relating to the scientific aspects of marine pollution to its sponsors, to IOC, to other organizations of the United Nations system and to States Members of the United Nations; and
- to prepare periodic reviews of the state of the marine environment as regards marine pollution and to identify problem areas requiring special attention.

During its existence a large number of reports have been prepared by GESAMP on a variety of topics ranging from hazard evaluation of harmful substances carried by ships, problems associated with coastal area development, oil in the marine environment, biological monitoring, criteria for selection of dumping sites, and transfer of pollutants from the atmosphere into the sea. The first global report on the Health of the Oceans involving the participation of all relevant United Nations bodies (United Nations, UNEP, FAO, WHO, WMO, IMCO and IAEA) was prepared under the auspices of GESAMP and completed in late 1981.

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<sup>13/</sup> Extracted from RSRS No. 1, amended and edited.

### Concern for the Oceans

271. GESAMP and the Regional Seas Programme are not the only mechanisms contributing to the overall goal of GEMS in assessing the quality of the marine environment. The reports of SCOR, ICES, ICSEM, IGOSS and of many other intergovernmental organizations should also be acknowledged as an invaluable input into GEMS.

### Global Management Programmes, including Global Legal Agreements

272. As governmental and public awareness of environmental considerations has grown, the number of international agreements aimed at the protection and rational management of the environment has considerably increased.

273. One of the major breakthroughs for the legal regime for the oceans was the adoption of the United Nations Convention of the Law of the Sea. It can also be considered a breakthrough in global environmental legislation since a great many of its provisions have a direct bearing on the environment.

274. The UN Convention on the Law of the Sea has now been concluded, adopted and signed by the majority of UN member states. Although it has not yet entered into force it is already considered to have far-reaching effects on global attitudes concerning the Seas of the World, most particularly through those provisions that refer to conservation, to the protection and management of the marine and coastal environment and its resources and the co-operation of States to this end <sup>14/</sup>. More than 25 Indian Ocean States are signatories of the Law of the Sea Convention.

275. UNEP has suggested several ways in which it will be able to help in the implementation of the Convention. In particular, it would be able to undertake, within the resources available, certain specific tasks in the areas of assessment and monitoring to assist the International Seabed Authority when they draw up regulations for the conduct of seabed mining and to assist States through the provision of global guidelines and of training and experts in the fields of legislation, environmental management and conservation. UNEP will continue to give high priority to the development of regional activities in this context.

276. The UNCLOS negotiations have certainly benefitted from the legal agreements that have previously been adopted for the purposes of protecting the marine environment. Early international agreements mostly focused on pollution from ships and on oil pollution in particular. One of the first international marine environment agreements was the 1954 Convention for the Prevention of Pollution of the Seas by Oil.

277. In 1958, the Convention on the High Seas was adopted. Two articles of the agreement were concerned with the control of pollution: one with discharge of oil from ships or pipelines or resulting from the exploitation and exploration of the seabed and its subsoil, the other with radioactive waste.

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<sup>14/</sup> Articles 192-237 specifically refer to the protection and preservation of the marine environment; Arts. 61-68 to the development of living and other resources, Arts. 136-149, 238-265 to marine research etc., Arts. 19-24, 42-43, 56-58 contain provisions for the control of pollution in connection with rights and control duties concerning innocent and transit passage and the Exclusive Economic Zone (EEZ) whereas Arts. 123 and 197 require the co-operation of States both on a global and regional basis.

278. Two important agreements concerned with compensation for ship-generated pollution were adopted in 1969 (Brussels): the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties and the International Convention on Civil Liability for Oil Pollution Damage (Civil Liability Convention (CLC)). The latter was later supplemented by the 1971 convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (IFC).

279. Protocols have been adopted in 1984 to both CLC and IFC. Among other provisions, the two Protocols adopted will increase the total compensation available to victims of oil pollution to \$200 million, deriving both from shipowners (CLC) and from oil importers' contributions (IFC).

280. In the early 1970s two additional global conventions were adopted aimed at controlling pollution by dumping and ship - generated pollution. The 1972 Convention on the Prevention of Marine Pollution by Dumping of Waste and other Matter (London Dumping Convention (LDC)) was negotiated under the auspices of the secretariat preparing the 1972 Stockholm Conference on the Human Environment as part of the preparation of the action plan adopted by the Conference. It groups substances into categories according to the gravity of the risks they present to the marine environment as was done in the Oslo Convention.

281. The 1973 International Convention for the Prevention of Pollution from Ships (MARPOL Convention) extends the 1954 Convention for the Prevention of Pollution of the Seas by Oil to all types of vessel-source pollution, with the objective of completely eliminating pollution of the marine environment by oil and other harmful substances caused by international discharges from ships. The MARPOL convention has been extended and updated by a protocol adopted at the IMCO Conference on Tanker Safety and Pollution Prevention (London 1978) and is now known as MARPOL 73/78. It entered into force in October 1983. Several Indian Ocean coastal states are Contracting Parties of one or more of CLC, IFC, LDC, and MARPOL 73/78.

282. In parallel with the development of international agreements concerned with controlling pollution, States have also adopted global conventions aimed at the management of living resources. In 1946 the International Convention for the Regulation of Whaling was adopted. The objective of the Convention is to protect all species of whales from overfishing and to establish a system of international regulations for the whale fisheries in order to ensure proper conservation and development of whale stocks.

283. A particularly positive development was the designation by the International Whaling Commission (IWC) of an Indian Ocean Sanctuary in which all commercial whaling is prohibited. It was a significant step for the prevention of extinction of whales in the region and leads to other positive conservation measures by Indian Ocean Coastal states, either jointly or individually.

284. With a view to contributing towards more effective measures for the proper conservation of whales and other badly depleted marine mammals, UNEP, in co-operation with FAO, has prepared a Global Plan of Action for the Conservation of Marine Mammals. Problems concerning them are, to a great degree, international because of the highly migratory character of marine mammals and call for co-operative solutions. Some of the proposed actions are urgent, as the threats to the survival and well-being of these valuable resources are increasing daily.

285. The Convention on Fishing and Conservation of the Living Resources of the High Seas was adopted in 1958 with the objective of solving, through international co-operation, the problems involved in the conservation of living resources of the



high seas taking into account that the development of modern techniques for exploitation had placed some of these resources in danger of being over-exploited.

286. The objective of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which was adopted in 1973, is to protect endangered species from over-exploitation through international trade by establishing an international system of import/export permits. The convention's provisions are applicable to animals and plants, dead or alive, listed in the appendices, and any recognizable parts or derivatives thereof.

287. The 1971 Convention on Wetlands of International Importance, Especially as Waterfowl Habitat, adopted at Ramsar (Wetlands Convention), aims at stemming the progressive encroachment on and loss of wetlands, recognizing their ecological functions as regulators of water regimes and as habitats and their economic, cultural, scientific and recreational value.

288. The 1979 Bonn Convention on Conservation of Migratory Species of Wild Animals (Migratory Species Convention) was another significant step forward in the conservation of species which, as part of their life cycle, travel across borders, often of several States.

289. Although not officially adopted by the UNEP Governing Council, the Montreal Global Guidelines for the Protection of the Marine Environment against Pollution from Land-Based Sources will certainly provide a framework for the formulation of legislation and of regional agreements concerned with this important form of pollution.

290. In addition to promoting the adoption of international legal agreements, international organizations have been actively promoting global programmes to assist States in managing their marine and coastal resources.

291. UNESCO's Man and the Biosphere Programme (MAB) was officially launched in 1970. It represents an integrated approach to research, training and action aimed at improving man's partnership with the environment. Several project areas now being implemented are of direct interest to the marine and coastal environment.

292. In 1980 the World Conservation Strategy was launched. It was prepared by IUCN in co-operation with the World Wildlife Fund and UNEP, with the collaboration of UNESCO and FAO. The strategy is intended to stimulate a more active approach to the management of living resources and to provide policy guidance on how this can be carried out. The strategy addresses itself to several aspects of the protection and development of the marine and coastal environment.

#### Contribution of Regional Programmes to Global Activities

293. IUCN, in co-operation with UNEP, has very recently (1985) completed an overall study, and five sub-regional reviews, on the Management and Conservation of Renewable Marine Resources in the Indian Ocean Region. This, in conjunction with the World Conservation Strategy, may well serve as a starting point for an inter-regional programme in the Indian Ocean.

294. Experience has demonstrated that regional agreements and co-operative activities may usefully strengthen, and sometimes serve to elaborate, global agreements and principles adopted by the international community. Regional programmes and agreements may provide an important middle step between global

projects and national implementation of those projects and programmes. Regional co-operation, which often provides the most suitable framework for an exchange of information and experiences, assistance and training, and an established political perception of the benefits to be derived from concerted regional action, seems to permit more readily the translation of principles and objectives into concrete actions and commitments. Regional agreements have also been directed at the elaboration of controls and programmes for management of globally important ecosystems, species, and habitats.

295. UNESCO's Major Inter-regional Project for Research and Training on Integrated Management of Coastal systems (COMAR) is one of UNESCO's "major projects" and provides the understanding and management of systems such as mangroves, coastal lagoons, estuaries, coral reefs, etc. separately and as interdependent units.

296. On the initiative of UNEP, six United Nations bodies (UN/DIESA, UNIDO, UNCHS, FAO, UNESCO, IMO) have co-operated in the development of a model workshop on assessment of the environmental impact of coastal development projects. The model workshop package is based on actual problems that are typically encountered by developing states and includes an instruction manual, a student manual, case studies and a mini-library for reference and background reading.

297. The management of fisheries is an activity that has both global and regional aspects. Although the recognition of 200-mile Exclusive Economic Zones (EEZs) is extending national control of the world's coastal and island States over many of the fish resources, fishing remains a very international activity. While FAO's fisheries programme is global in scope, it is implemented through FAO's regional Fisheries Commissions such as IOFC in the Indian Ocean and IPFC in the Indo-Pacific.

298. The regional studies on physical transport which may influence the distribution of pollutants by water mass movements are an important element in understanding the global transport of pollutants. The IOC-co-ordinated studies of the Kuroshio Current (CSK), the SCOR-inspired IIOE, the efforts by ICES in the Baltic and in the North Sea, the joint WMO/IOC programme on IGOSS and the MEDPOL project on coastal transport processes, are typical examples of such studies.

299. The need for careful intercalibration of sampling and analytical methods is fully recognized in all regional programmes. Bearing in mind the practical difficulties, the only feasible way of conducting intercalibration is probably on a regional basis, using some laboratories (e.g. ILMR of MONACO) as global intercalibration centres for selected pollutants.

300. Intercalibration is also necessary for biological data, for example in species identification. The various natural biological specimen reference collections being established, e.g. with UNESCO assistance, are designed to help in this respect.

#### IV. AVENUES FOR THE FUTURE

301. As mentioned earlier, the regional approach was expected to "provide a basis for dealing effectively with the environmental problems of the ocean as a whole". The time may now be ripe to proceed to such a more general approach and the Indian Ocean, the smaller of the large oceans, may well lend itself for such an experiment.

302. From a careful comparison of the five action plans described above it will be noticed that several of their features and all of their objectives are similar, even if they can not always be identical.

303. A link up of these features and of the relevant programme and projects can only have positive effects and could encompass several advantages. An inter-regional approach to at least some of them should, therefore, be envisaged. The last session of UNEP's Governing Council specifically stressed the need and desirability for such inter-regional co-operation, and identified the Regional Seas Programme as the programme area in which it should be achieved.

304. Taking into account the elements of the five regional action plans carried out or being developed in the framework of the Regional Seas Programme in the wider Indian Ocean region, one can readily recognize areas and mechanisms which may become parts of and used in a broad co-operation effort covering the whole region.

#### Areas of prospective inter-regional co-operation

305. Problems identified as priorities for the five regional action plans are frequently similar and may become an obvious subject of inter-regional co-operation. The following are but a few examples:

- (a) monitoring of sources, levels and effects of pollutants entering the Indian ocean;
- (b) protection and environmentally sound management of characteristic ecosystems, such as coral reefs and mangroves;
- (c) establishment and management of areas requiring special protection, including protection of endangered fauna and flora indigenous to the Indian Ocean region;
- (d) protection of coastal areas from erosion;
- (e) environmental awareness projects and other "supporting measures", such as training courses, production of publications, posters, pamphlets, etc. and a common Environmental Conduct Guide.

306. Subjects not specific for any of the regional action plans but common to all of them should also be considered as possible fields for inter-regional co-operation. Protection of migratory species, marine mammals in particular, joint research on the oceanic and biological processes of the Indian Ocean which may have an effect on the activities of the individual regional action plans and study of long-range transport of pollutants by air or oceanic currents may be mentioned as examples.

307. The forms of inter-regional co-operation may vary from subject to subject and may include:

- exchange of information and expertise;
- development, testing and application of common research and management, guidelines and techniques, whenever feasible;
- carrying out pilot projects whose results may have a more general application in the whole Indian Ocean region;

- agreement on common policies towards the protection for fauna and flora, in particular for migratory species;
- assistance based on experts from the region who share the understanding of the specific environmental problems of the region.

Mechanisms which may be used for inter-regional co-operation

308. Each of the action plans is under the overall authority of a regional group of States which provide policy guidance and funds for the action plans. Decisions on all programme and budgetary matters are taken at regular high-level intergovernmental meetings or at meetings of Contracting Parties whenever a regional convention is part of an action plan.

309. While UNEP provides for the general technical co-ordination of the Regional Seas Programme, each of the five action plans has its specific co-ordinating centre (secretariat) which takes care of the day-to-day activities. They are:

- for KAP: the Regional Organization for the Protection of the Marine Environment (ROPME) in Kuwait;
- for RED: the secretariat of the Red Sea and Gulf of Aden Environment Programme (PERSGA) in Jeddah;
- for EAF: the Oceans and Coastal Areas Programme Activity Centre (OCA/PAC) of UNEP in Geneva;
- for EAS: same as for EAF
- for SAS: the development of SAS is co-ordinated by the OCA/PAC of UNEP; after the formal adoption of the SAS action plan it is expected that the South Asia Co-operative Environment Programme (SACEP) in Colombo will be designated as the secretariat of that action plan.

310. The funds needed to support the development and implementation of the action plans are provided by the States participating in them (through specially established Trust Funds), by UNEP (through the Environment Fund) and by third parties (other organizations of the UN family system in particular). They amounted (in thousands of US\$) until today:

	KAP	EAF	EAS	SAS	RED
Trust Funds	5,203	-	154	-	-
UNEP	995	1,202	1,444	304	323
Other Parties	1,805	166	1,276	122	1,304
<b>TOTAL</b>	<b>8,003</b>	<b>1,368</b>	<b>2,874</b>	<b>426</b>	<b>1,627</b>

311. From the foregoing it is obvious that the action plans are governed by well established structures and are financed through agreed financial arrangements. Therefore the most rational approach to an Indian Ocean co-operative programme seems

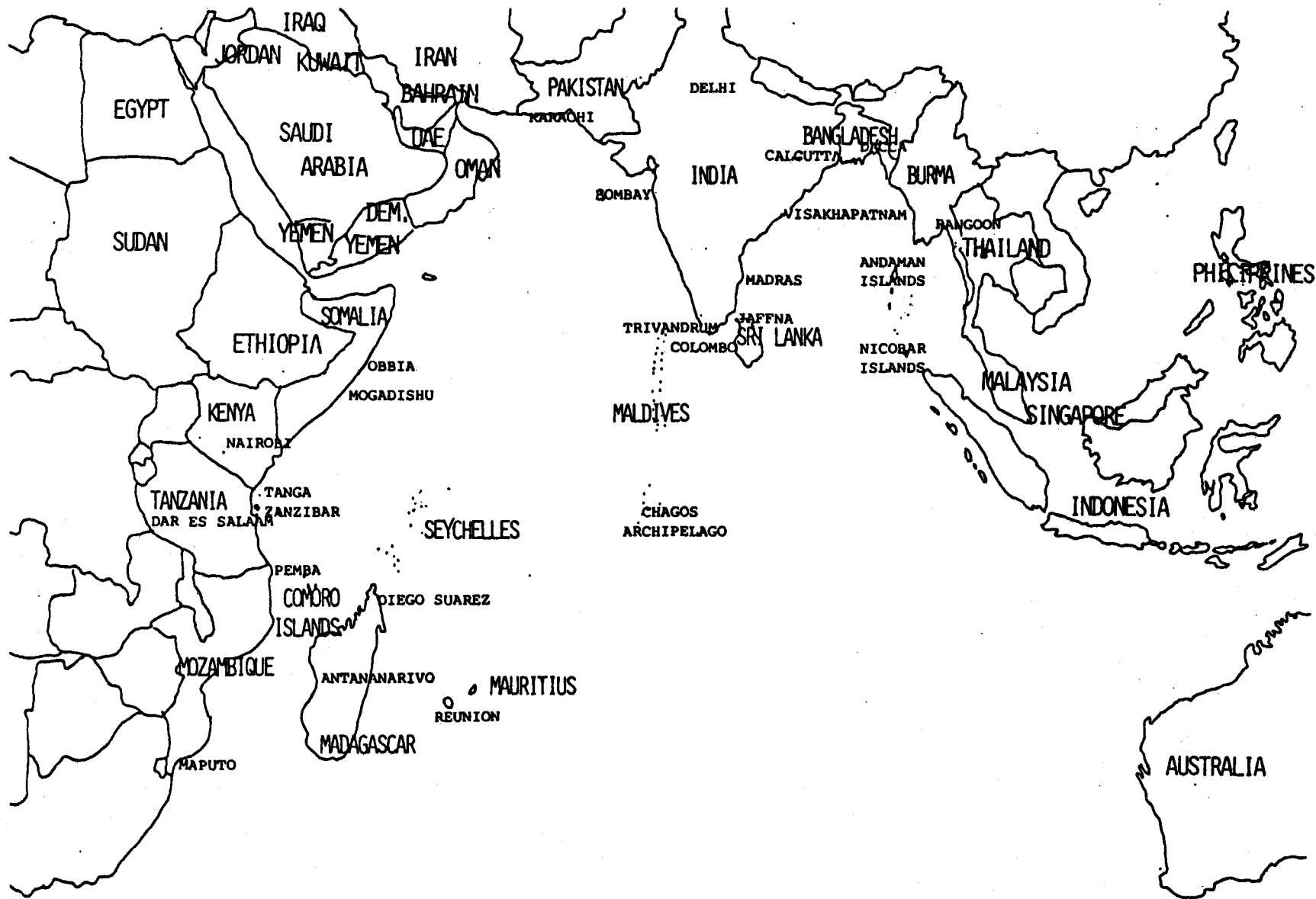
to be the use of existing co-ordinating and funding mechanisms in order to achieve the goals which are perceived as common goals of all states interested in the Indian Ocean as a whole. This could be accomplished through regular consultations of states participating in the five action plans and without creating costly new co-ordinating bodies.

312. In the light of the decisions of UNEP's Governing Council (referred to in paragraph 303) UNEP intends to convene in the near future a meeting of the secretariats of the five action plans to discuss the areas and fields in which inter-regional co-operation could be developed as well as the ways and means of such co-operation. The meeting would be followed-up by a meeting of the representatives of the Contracting Parties, or intergovernmental bodies exercising overall authority over the action plans to consider policy issues relevant to inter-regional co-operation.

#### The ultimate goal

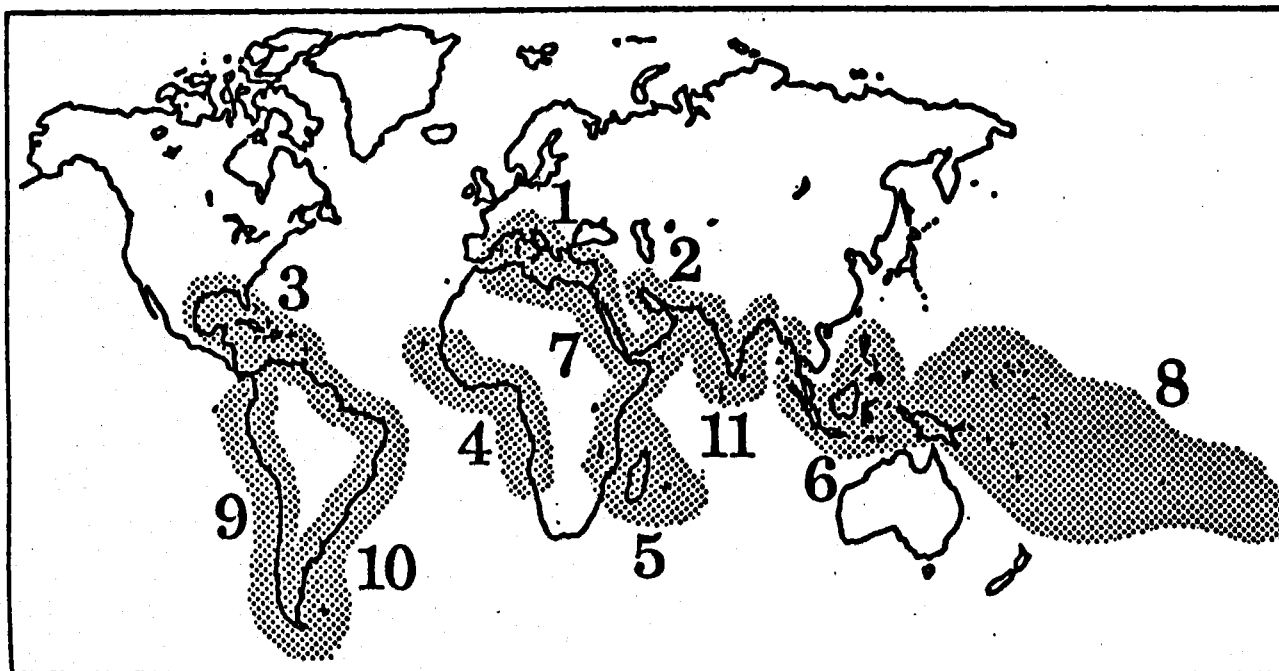
313. In view of the latest perceptions on environmental interactions and the fact that development, including socio-economic development, and human conditions have a direct bearing on environmental conditions, any co-operation in the socio-economic, technical and even political fields is expected to have beneficial repercussions on the environment and should be promoted and monitored with this in mind.

314. A sense of belonging and togetherness around the common ocean, united, not separated by it, should be an ultimate goal.



THE INDIAN OCEAN - GEOGRAPHICAL LAYOUT

Annex I



UNEP REGIONAL SEAS PROGRAMME  
GEOGRAPHICAL COVERAGE

Annex II

1. Mediterranean Region	Action Plan adopted:1975; Regional Convention signed: 1976
2. Kuwait Action Plan Region	Action Plan adopted:1978; Regional Convention signed: 1978
3. Wider Caribbean Region	Action Plan adopted:1981; Regional Convention signed: 1983
4. West and Central African Region	Action Plan adopted:1981; Regional Convention signed: 1981
5. Eastern African Region	Action Plan adopted:1985; Regional Convention signed: 1985
6. East Asian Region	Action Plan adopted:1981
7. Red Sea and Gulf of Aden Region	Action Plan adopted:1982; Regional Convention signed: 1982
8. South Pacific Region	Action Plan adopted:1982; Regional Convention in preparation
9. South-East Pacific Region	Action Plan adopted:1981; Regional Convention adopted: 1981
10. South-West Atlantic Region	Action Plan preparation to be initiated
11. South Asian Seas Region	Action Plan preparation initiated

Annex III

PARTICIPANTS IN UNEP'S REGIONAL SEAS PROGRAMME

1. MEDITERRANEAN REGION

Algeria	Israel	Morocco
Cyprus	Italy	Spain
EEC	Lebanon	Syrian Arab Republic
Egypt	Libyan Arab Jamahiriya	Tunisia
France	Malta	Turkey
Greece	Monaco	Yugoslavia

2. KUWAIT ACTION PLAN REGION

Bahrain	Kuwait	Saudi Arabia
Iran	Qatar	United Arab Emirates
Iraq	Oman	

3. WEST AND CENTRAL AFRICAN REGION

Angola	Ghana	Nigeria
Benin	Guinea	Rep. of Cameroon
Cape Verde	Guinea-Bissau	Sao Tome and Principe
Congo	Ivory Coast	Senegal
Equatorial Guinea	Liberia	Sierra Leone
Gabon	Mauritania	Togo
Gambia	Namibia	Zaire

4. WIDER CARIBBEAN REGION

Antigua and Barbuda	EEC	Netherlands
Bahamas	France	Nicaragua
Barbados	Grenada	Panama
Belize	Guatemala	St. Lucia
Colombia	Guyana	St. Vincent and the Grenadines
Costa Rica	Haiti	Suriname
Cuba	Honduras	Trinidad and Tobago
Dominica	Jamaica	United Kingdom
Dominican Republic	Mexico	United States of America
		Venezuela

5. EAST ASIAN REGION

Indonesia	Singapore
Malaysia	Thailand
Philippines	



6. SOUTH-EAST PACIFIC REGION

Colombia	Panama
Chile	Peru
Ecuador	

7. RED SEA AND GULF OF ADEN REGION

Democratic Yemen	Palestine (PLO)	Sudan
Djibouti	Saudi Arabia	Yemen
Jordan	Somalia	

8. SOUTH PACIFIC REGION

American Samoa	Kiribati	Solomon Islands
Australia	Marshall Islands	Tokelau
Commonwealth of the Northern Mariana Islands	Nauru	Tonga
Cook Islands	New Caledonia	Tuvalu
Federated States of Micronesia	New Zealand	United Kingdom
Fiji	Niue	United States of America
France	Norfolk Island	Vanuatu
French Polynesia	Palau	Wallis and Futuna
Guam	Papua New Guinea	Western Samoa
	Pitcairn Island	

9. EASTERN AFRICAN REGION

Comoros	Madagascar	Somalia
EEC	Mauritius	United Republic of Tanzania
France	Mozambique	
Kenya	Seychelles	

10. SOUTH-WEST ATLANTIC REGION

Argentina  
Brazil  
Uruguay

11. SOUTH ASIAN SEAS REGION

Bangladesh	Pakistan
India	Sri Lanka
Maldives	

Annex IV

PREPARATORY MEETINGS FOR AN ACTION PLAN IN THE  
EAST ASIAN SEAS

A basis for the action plan has been provided by the following activities:

- (a) IOC/FAO(IPFC)/UNEP International Workshop on Marine Pollution in East Asian Waters, Universiti Sains Malaysia, Penang, 7 - 13 April 1976;
- (b) Indo-Pacific Fisheries Council (IPFC): Third Session of the IPFC Working Party on Aquaculture and Environment, Bangkok, 31 August - 3 September 1976;
- (c) IMCO/UNEP Oil Pollution Contingency Planning for the Straits of Malacca and Singapore Region - Preparatory Stage, November 1976;
- (d) ASEAN Council on Petroleum (ASCOPE): First Petroleum Conference and Exhibition, Jakarta, 11 - 13 October 1977;
- (e) ESCAP/UNEP Intergovernmental Meeting on Environmental Protection Legislation, Bangkok, 4 - 8 July 1979;
- (f) Committee for Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas (CCOP): Fifteenth Session, Singapore, 24 October - 6 November 1978;
- (g) UNESCO Regional Seminar on Human Uses of the Mangrove Environment and Management Implications, Dacca, Bangladesh, 4 - 10 December 1978;
- (h) ASEAN Expert Meeting on the Environment, Jakarta, 18 - 20 December 1978;
- (i) Fifth Meeting of the ASEAN Experts Group on Marine Pollution, Manila, 7 - 9 February 1979;
- (j) IOC (UNESCO) Workshop on the Western Pacific (WESTPAC), Tokyo, 19 - 20 February 1979;
- (k) UNEP Mission to the East Asian Seas region to enquire about the feasibility of an action plan, March 1979;
- (l) Second Meeting of the ASEAN Experts on the Environment, Penang, 17 - 20 September 1979;
- (m) IMCO/UNEP Meeting on the Development of Sub-regional Oil Spill Contingency Arrangements in the Celebes (Sulawesi) Sea, Jakarta, 7 - 9 January 1980;
- (n) FAO/UNEP (convened in collaboration with UNESCO and IUCN) Expert Consultation on Impact of Pollution on the Mangrove Ecosystem and its Productivity in South Asia, Manila, 4 - 8 February 1980;
- (o) ESCAP (CCOP)/UNEP Ad Hoc Group Meeting on the Marine Environment, Bangkok, 20 - 25 March 1980;
- (p) IOC (UNESCO)/WESTPAC Workshop on Coastal Transport of Pollutants, Tokyo, 27 - 31 March 1980;

- (q) Third Meeting of the ASEAN Experts on the Environment, Manila, 19 - 23 May 1980;
- (r) UNESCO/UNEP Expert Consultation on River Inputs to Southeast Asian Seas, Jakarta, 2 - 4 June 1980;
- (s) ASEAN Workshop on Nature Conservation of the ASEAN Experts on the Environment, Denpasar, 15 - 19 September 1980;
- (t) Fourth Meeting of the ASEAN Experts on the Environment, Singapore, 8 - 10 April 1981;
- (u) Additional studies, suggestions and proposals received from the United Nations System.

Annex V

PRIORITY PROGRAMME OF ACTIVITIES IN THE  
EASTERN AFRICAN REGION

<u>A. Projects of regional importance</u>	<u>Priority ratings</u>
1. Inventory of ecosystems in the region, in particular mangroves, lagoons and coral reefs, and harmonization of national legislation with respect to mangroves, lagoons and coral reefs.	1
2. Regional inventory and documentation of all existing protected areas, with proposals for new ones and for harmonization of management policies.	1
3. Regional inventory and documentation of all endangered species, with descriptions of critical habitats and proposals for preserving them.	1
4. Development of a network of environmental pollution control laboratories.	1
5. Assessment of socio-economic activities that may have an impact on the marine and coastal environment and development of suitable planning and management techniques to prevent adverse consequences of such activities on the marine and coastal environment.	1
6. Development of a network of oil pollution monitoring and control centres.	1
7. Assessment of socio-economic activities that may have an impact on the marine and coastal environment and development of suitable planning and management techniques to prevent adverse consequences of such activities on marine and coastal environment.	1
8. Elaboration of oil pollution contingency plans, designation, as appropriate, of oil pollution emergency centres and provision of training and equipment and other material necessary for intervention in pollution incidents up to a scale of major disasters. Training should also be provided which takes into account the provisions of MARPOL 73/78 and other IMO conventions relevant to the East African region.	1
9. Development and adoption of a regional convention for the protection and development of the marine and coastal environment of the East African region and protocols concerning:  - co-operation in combating pollution in cases of emergency;  - specially protected areas and endangered species.	1

10. Preparation and application of a regional environmental education programme, with particular reference to the development of teaching materials including the publication of a school text book and public information campaigns, geared to increasing environmental awareness. 1
11. Network for the surveillance and control of foreign vessels carrying out illegal fishing activities in the region. 2
12. Training of scientists and technicians in marine sciences. 2
13. Assessment of the continuous spread of sand dunes along the coastal areas and the effects of coastal sand and lime extraction for construction purposes and study of the means to control them. 2
14. Training in methods of establishment of environmental quality criteria and waste discharge regulations. 2
15. Study of alternative forestry activities to replace the use of mangroves for the production of firewood. 2
16. Provision, where appropriate, of reception facilities in the region for shore-based discharge of oily ballast and other pollutants in preparation for the declaration of the region as a discharge-free zone. 2
17. Training of staff in the management and supervision of marine and coastal national parks. 2
18. Assistance in the enactment and harmonization of environmental legislation concerning coastal and marine areas. 2
19. Regional study to improve fish handling, distribution and quality control. 3
20. Assessment of origin and magnitude of pollution from industrial and agricultural activities. 3
21. Study of oceanic and coastal circulation relevant to the transport of oil pollution in the region. 3

B. Projects of subregional importance

22. Study of ciguatera poisoning and heavy metal, organochlorine and radioactive contamination in fish. 1
23. Assessment of the impact of dynamite fishing and coral destruction on the coastal and marine habitats and their socio-economic effects on the coastal populations. 1
24. Study of green turtles, harmonization of national legislation and co-operation on protection measures. 2

25. Assistance in species identification shrimps and spiny lobsters, as well as related stock assessment programmes, and establishment of a regional tuna stock identification system using biochemical, genetic and other related analytical techniques. 2
26. Preparation of a survey on and assistance in improving present sewage disposal systems. 2
27. Short television films and publications of material on ciguatera and fish quality control. 2
28. Study of the behaviour and movement of sharks in the region, particularly where the tourist industry is affected. 2

Annex VI

ACRONYMS AND ABBREVIATIONS

ALECSO	Arab League Educational, Cultural and Scientific Organization
Art.	Article
ASCOPE	Asean Council on Petroleum
ASEAN	Association of South-East Asian Nations
ASEP	ASEAN Subregional Environment Programme
ASFIS	Aquatic Sciences and Fisheries Information System (of FAO)
Barcelona Convention	Convention for the Protection of the Mediterranean Sea against Pollution (1976)
Bonn Agreement	Agreement for Co-operation in Dealing with Pollution of the North Sea by Oil (1969)
CCOP	Committee for Coordinating Joint Prospecting for Mineral Resources in Asian Offshore Areas (of UN)
CINCWIO	Co-operative Investigation of the Northern and Central Western Indian Ocean (of IOC)
CINDIO	Central Indian Ocean
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna, Washington 1973
CLC	International Convention on Civil Liability for Oil Pollution Damage, 1969
COBSEA	Co-ordinating Body on the Seas of East Asia
COFI	Committee on Fisheries (of FAO)
COMAR	Inter-regional Project for Research and Training on Integrated Management in Coastal Areas (of UNESCO)
CPPS	Permanent Commission for the South Pacific
CSK	Co-operative Study of the Kuroshio and Adjacent Regions (of IOC)
DDT	1,1,1-trichloro-2,2-bis (chlorophenyl)-ethane
DOEM	Designated Officials for Environmental Matters (of relevant United Nations bodies)
Dumping Protocol	Protocol for the Prevention of Pollution by Dumping from Ships and Aircraft

EAF	Eastern African (Region)
EAS	East Asian Seas (Region)
ECA	Economic Commission for Africa (of the United Nations)
ECE	Economic Commission for Europe (of the United Nations)
ECLA	Economic Commission for Latin America (of the United Nations)
ECOSOC	Economic and Social Council (of the United Nations)
ECWA	Economic Commission for Western Asia (of the United Nations)
EEC	European Economic Community
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement (or Study)
Emergency Protocol	Emergency Protocol: Protocol Concerning Co-operation in Combating Pollution by Oil and other Harmful Substances in Cases of Emergency
ESCAP	Economic and Social Commission for Asia and the Pacific (of the United Nations)
FAO	Food and Agriculture Organization of the United Nations
GC	Governing Council of UNEP
GEMS	Global Environment Monitoring System (of UNEP)
GEMSI	Group of Experts on Methods, Standards and Intercalibration (of GIPME)
GESAMP	IMCO/FAO/UNESCO/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Pollution
GIPME	Global Investigation of Pollution of the Marine Environment (of IOC)
HELCOM	Helsinki Commission (Baltic Marine Environment Protection Commission) of the Convention of the Marine Environment of the Baltic Sea Area (Helsinki Convention)
Helsinki Convention	Convention on the Protection of the Marine Environment of the Baltic Sea Area (1974)
IAEA	International Atomic Energy Agency
IBRD	International Bank for Reconstruction and Development (of ESCAP)
ICES	International Council for the Exploration of the Sea
ICITA	International Co-operative Investigations of the Tropical Atlantic (of IOC)



ICNAF	International Commission for North-West Atlantic Fisheries
ICSEM	International Commission for the Scientific Exploration of the Mediterranean Sea
ICSPRO	Inter-Secretariat Committee on Scientific Programme Relating to Oceanography (of the United Nations, FAO, UNESCO, WMO and IMCO)
ICSU	International Council of Scientific Unions
IDOE	International Decade of Ocean Exploration
IFC	International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971
IGOSS	Integrated Global Ocean Services System (of IOC)
IIOE	International Indian Ocean Expedition
ILMR	International Laboratory of Marine Radioactivity (of IAEA)
IMCO	Inter-Governmental Maritime Consultative Organization (now IMO)
IMDG	International Maritime Dangerous Goods Code (of IMO)
IMO	International Maritime Organization (formerly IMCO)
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IOCINDIO	IOC Programme Group for the Central Indian Ocean
IODE	International Oceanographic Data Exchange (Working Committee of IOC)
IOFC	Indian Ocean Fishery Commission
IPFC	Indo-Pacific Fishery Commission (of FAO)
IRPTC	International Register of Potentially Toxic Chemicals
IUCN	International Union for Conservation of Nature and Natural Resources
IWC	International Whaling Commission
Jeddah Convention	Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment
KAP	Kuwait Action Plan (Region)
Kuwait Convention	Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment from Pollution (1978)
LBS	Land-Based Sources (of Pollution)
LEPOR	Long-Term Expanded Programme for Oceanic Exploration and Research (of IOC)

London Dump- ing Conven- tion (LDC)	Convention on the Prevention of Marine Pollution by Dumping of Waste and other Matter (1972)
LOS	Law of the Sea
MAB	Man and the Biosphere Programme (of UNESCO)
MAPMOPP	Pilot Project on Marine Pollution (Petroleum) Monitoring (of IGOSS)
MARPOL Convention	International Convention for the Prevention of Pollution from Ships of 1973 and, in particular, "MARPOL 73/78" = Convention as modified by the Protocol of 1978
MARPOLMON	Marine Pollution Monitoring System (of GIPME)
MEDI	Marine Environmental Data Information (of IOC)
MEDPOL	Co-ordinated Mediterranean Pollution Monitoring and Research Programme (of the Mediterranean Action Plan)
MEMAC	Marine Emergency Mutual Aid Centre (of the Jeddah Action Plan)
MEMAC	Marine Emergency Mutual Aid Centre (of the Kuwait Action Plan)
MEPA	Marine Environment Protection Administration, Jeddah
MEPC	Marine Environment Protection Committee (of IMO)
NARA	National Aquatic Resources Agency (of Sri Lanka)
NFP	National Focal Point
NGO	Non-Governmental Organization
OCA/PAC	Oceans and Coastal Areas Programme Activity Centre (formerly RS/PAC, of UNEP)
OECD	Organization for Economic Co-operation and Development
Oslo Convention	Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft (1972)
Para.	Paragraph
Paris Convention	Convention for the Prevention of Marine Pollution from Land-Based Sources (1974)
PCB's	Polychlorinated biphenyls
PERSGA	Red Sea and Gulf of Aden Environment Programme (of ALECSO)
PRS	Position Reporting System
RAC	Regional Activity Centre
RCTT	Regional Centre for Technology Transfer (of ESCAP)

RCU	Regional Co-ordinating Unit
RED	Red Sea and Gulf of Aden Action Plan (Region)
ROPME	Regional Organization for the Protection of the Marine Environment (of the Kuwait Action Plan Region)
ROST	Regional Office for Science and Technology (of UNESCO)
ROSTSEA	Regional Office for Science and Technology for South Central Asia (of UNESCO)
RS/PAC	Regional Seas Programme Activity Centre (now OCA/PAC, of UNEP)
RSRS	Regional Seas Reports and Studies, a UNEP publications series
SACEP	South Asia Cooperative Environment Programme
SARG	South Asia Regional Cooperation
SAS	South Asian Seas (Region)
SCAR	Scientific Committee for Antarctic Research
SCOR	Scientific Committee on Oceanic Research (of ICSU)
SEAFDEC	South East Asian Fisheries Development Center
SPC	South Pacific Commission
SPEC	South Pacific Bureau for Economic Co-operation
SPF	South Pacific Forum
SPREP	South Pacific Regional Environment Programme
SWMTEP	System-Wide Medium-Term Environment Programme (of UNEP)
TAC	Total allowable catch
TCDC	Technical Cooperation among Developing Countries
TEMA	Training, Education and Mutual Assistance
UNCHS	United Nations Centre for Human Settlements
UNCLOS	United Nations Conference (or Convention) on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UN/DIESA	United Nations Department of International Economic and Social Affairs
UNDP	United Nations Development Programme
UNDRO	Office of the United Nations Disaster Relief Co-ordinator
UNEP	United Nations Environment Programme

UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research
WESTPAC	Working Group for the Western Pacific (of IOC)
Wetlands Convention	Conventions on Wetlands of International Importance, Especially as Waterpool Habitat, Ramsar, 1971
WGSTC	Working Group on Scientific and Technical Co-operation
WHO	World Health Organization
WHO/PEPAS	WHO Western Pacific Regional Centre for the Promotion of Environmental Planning and Advanced Studies
WMO	World Meteorological Organization
WRI	World Resources Institute

Annex VII

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